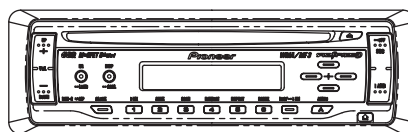


Service Manual



DEH-2800MP/XN/UC

ORDER NO.
CRT3554

HIGH POWER CD/MP3/WMA PLAYER WITH FM/AM TUNER

DEH-2800MP /XN/UC

DEH-2850MP /XN/ES

This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech. Module	Remarks
CX-3164	CRT3583	S10.5COMP1	CD Mech. Module : Circuit Descriptions, Mech. Descriptions, Disassembly



For details, refer to "Important Check Points for Good Servicing".

SAFETY INFORMATION

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

● CD Section Precaution



1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.



[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety



Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

- ① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

- ② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

- ③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

- ④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

- ⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

- ⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

- ⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

- ⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

- ⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

- ⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments



To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts



Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning



For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws



To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

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1. SPECIFICATIONS

● DEH-2800MP/XN/UC

General

Power source	14.4 V DC (10.8 – 15.1 V allowable)
Grounding system	Negative type
Max. current consumption	10.0 A
Backup current	5 mA or less
Dimensions (W × H × D):	
DIN	
Chassis	178 × 50 × 157 mm (7 × 2 × 6-1/8 in.)
Nose	188 × 58 × 20 mm (7-3/8 × 2-1/4 × 3/4 in.)
D	
Chassis	178 × 50 × 162 mm (7 × 2 × 6-3/8 in.)
Nose	170 × 48 × 15 mm (6-3/4 × 1-7/8 × 5/8 in.)
Weight	1.3 kg (2.9 lbs)

Audio

Continuous power output ...	22 W × 4 (50 – 15 000 Hz, 5% THD, 4 Ω load, both channels driven)
Maximum power output	50 W × 4
Load impedance	4 Ω (4 – 8 Ω allowable)
Preout max output level/output impedance	2.2 V/1 kΩ
Bass/Mid/Treble:	
Bass	
Frequency	100 Hz
Gain	±13dB
Mid	
Frequency	1 kHz
Gain	±12dB
Treble	
Frequency	10 kHz
Gain	±12dB
Loudness contour:	
Low	+7 dB (100 Hz), +4 dB (10 kHz)
High	+10 dB (100 Hz), +6.5 dB (10 kHz) (volume: –30 dB)

CD player

System	Compact disc audio system
Usable discs	Compact disc
Signal format:	
Sampling frequency	44.1 kHz
Number of quantization bits	16; linear
Frequency characteristics ...	5 – 20 000 Hz (±1 dB)

Signal-to-noise ratio	94 dB (1 kHz) (IHF-A network)
Dynamic range	92 dB (1 kHz)
Number of channels	2 (stereo)
MP3 decoding format	MPEG-1 & 2 Audio Layer 3
WMA decoding format	Ver. 7, 7.1, 8, 9, 10 (2ch audio) (Windows Media Player)
WAV signal format	Linear PCM & MS ADPCM

FM tuner

Frequency range	87.9 – 107.9 MHz
Usable sensitivity	8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity	10 dBf (0.9 μV/75 Ω, mono)
Signal-to-noise ratio	75 dB (IHF-A network)
Distortion	0.3 % (at 65 dBf, 1 kHz, stereo) 0.1 % (at 65 dBf, 1 kHz, mono)
Frequency response	30 – 15 000 Hz (±3 dB)
Stereo separation	45 dB (at 65 dBf, 1 kHz)
Selectivity	80 dB (±200 kHz)
Three-signal intermodulation (desired signal level)	30 dBf (two undesired signal level: 100 dBf)

AM tuner

Frequency range	530 – 1 710 kHz (10 kHz)
Usable sensitivity	18 μV (S/N: 20 dB)
Signal-to-noise ratio	65 dB (IHF-A network)



Note

Specifications and the design are subject to possible modifications without notice due to improvements. □

● DEH-2850MP/XN/ES

General

A	Rated power source	14.4 V DC
	(allowable voltage range: 12.0 – 14.4 V DC)	
	Grounding system	Negative type
	Max. current consumption	10.0 A
	Backup current	5 mA or less
	Dimensions (W × H × D):	
	DIN	
	Chassis	178 × 50 × 157 mm
	Nose	188 × 58 × 20 mm
B	D	
	Chassis	178 × 50 × 162 mm
	Nose	170 × 48 × 15 mm
	Weight	1.3 kg

Audio

C	Continuous power output ...	22 W × 4 (50 – 15 000 Hz, 5% THD, 4 Ω load, both channels driven)
	Maximum power output	50 W × 4
	Load impedance	4 Ω (4 – 8 Ω allowable)
	Preout max output level/output impedance	2.2 V/1 kΩ
	Bass/Mid/Treble:	
	Bass	
	Frequency	100 Hz
	Gain	±13dB
	Mid	
	Frequency	1 kHz
	Gain	±12dB
	Treble	
	Frequency	10 kHz
	Gain	±12dB
D	Loudness contour:	
	Low	+7 dB (100 Hz), +4 dB (10 kHz)
	High	+10 dB (100 Hz), +6.5 dB (10 kHz)
	(volume: –30 dB)	

CD player

	System	Compact disc audio system
	Usable discs	Compact disc
	Signal format:	
	Sampling frequency	44.1 kHz
E	Number of quantization bits	16; linear
	Frequency characteristics ...	5 – 20 000 Hz (±1 dB)
	Signal-to-noise ratio	94 dB (1 kHz) (IEC-A network)
	Dynamic range	92 dB (1 kHz)

	Number of channels	2 (stereo)
	MP3 decoding format	MPEG-1 & 2 Audio Layer 3
	WMA decoding format	Ver. 7, 7.1, 8, 9, 10 (2ch audio)
	(Windows Media Player)	
	WAV signal format	Linear PCM & MS ADPCM

FM tuner

	Frequency range	87.5 – 108.0 MHz
	Usable sensitivity	8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
	50 dB quieting sensitivity	10 dBf (0.9 μV/75 Ω, mono)
	Signal-to-noise ratio	75 dB (IEC-A network)
	Distortion	0.3 % (at 65 dBf, 1 kHz, stereo)
		0.1 % (at 65 dBf, 1 kHz, mono)
	Frequency response	30 – 15 000 Hz (±3 dB)
	Stereo separation	45 dB (at 65 dBf, 1 kHz)

AM tuner

	Frequency range	531 – 1 602 kHz (9 kHz)
		530 – 1 640 kHz (10 kHz)
	Usable sensitivity	18 μV (S/N: 20 dB)
	Signal-to-noise ratio	65 dB (IEC-A network)



Note

Specifications and the design are subject to possible modifications without notice due to improvements. ■

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DEH-2800MP/XN/UC

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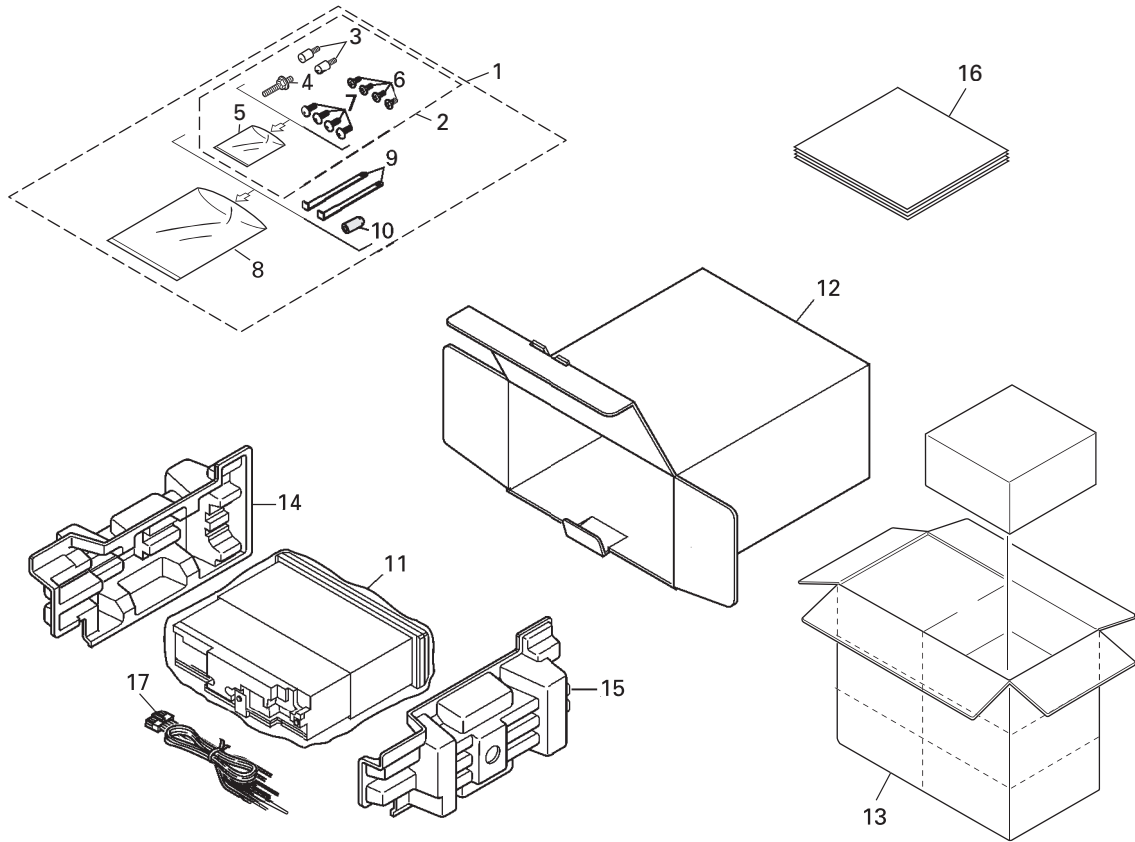
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2. EXPLODED VIEWS AND PARTS LIST

NOTES : • Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.
• The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
• Screw adjacent to ▽ mark on the product are used for disassembly.
• For the applying amount of lubricants or glue, follow the instructions in this manual.
(In the case of no amount instructions, apply as you think it appropriate.)

2.1 PACKING(DEH-2800MP/XN/UC)



PACKING(DEH-2800MP/XN/UC) SECTION PARTS LIST

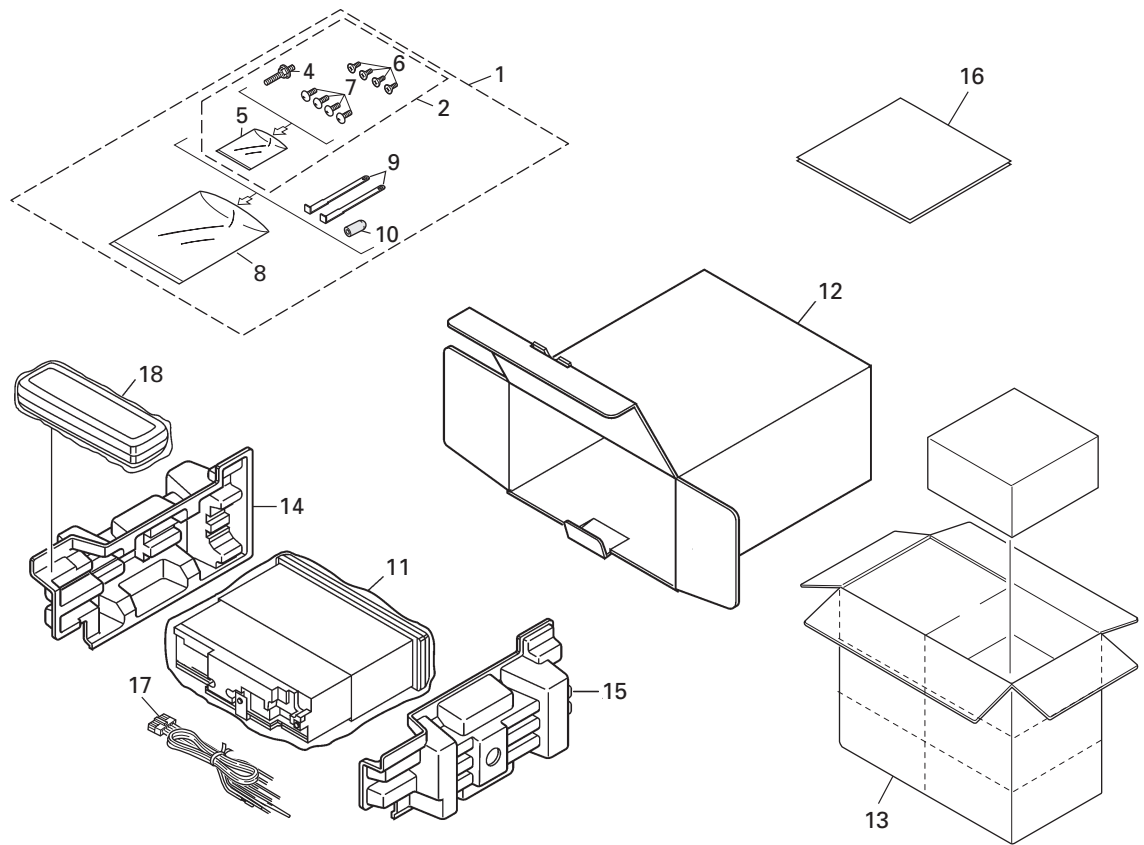
<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>
1	Accessory Assy	CEA4610	11	Polyethylene Bag	CEG1173
2	Screw Assy	CEA6002	12	Carton	CHG5633
3	Fixing Screw(M2 x 4)	CBA1994	13	Contain Box	CHL5633
4	Screw	CBA1650	14	Protector	CHP2664
* 5	Polyethylene Bag	CEG-127	15	Protector	CHP2868
6	Screw	CRZ50P090FTC	16-1	Owner's Manual	CRD4027
7	Screw	TRZ50P080FTC	16-2	Installation Manual	CRD4028
* 8	Polyethylene Bag	CEG-158	16-3	Caution Card	CRP1310
9	Handle	CNC5395	* 16-4	Warranty Card	CRY1247
10	Bush	CNV3930	17	Cord Assy	XDE7008

Owner's Manual,Installation Manual

<u>Part No.</u>	<u>Language</u>
CRD4027	English, French, Spanish
CRD4028	English, French, Spanish

2.2 PACKING(DEH-2850MP/XN/ES)

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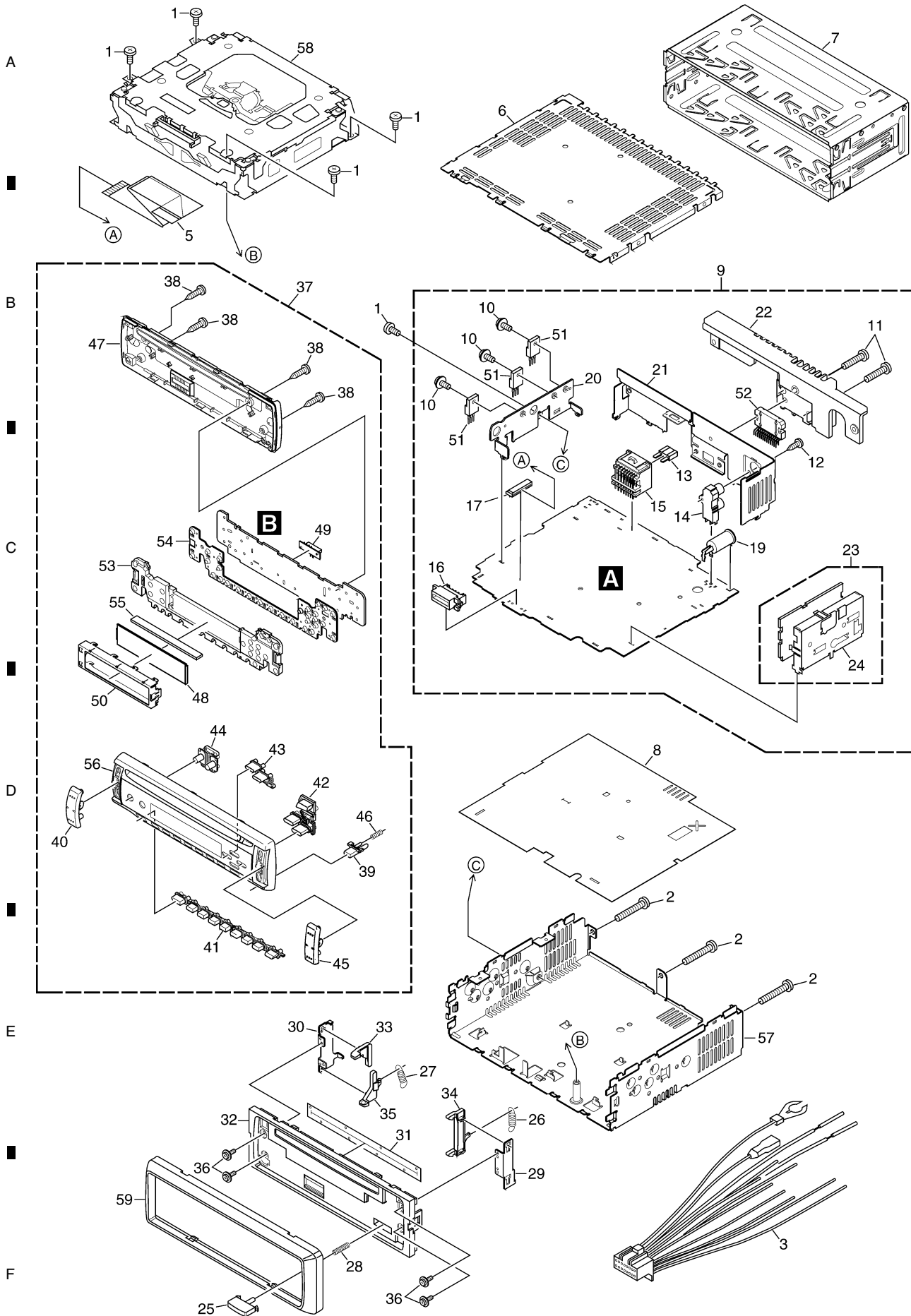
PACKING(DEH-2850MP/XN/ES) SECTION PARTS LIST

<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>
1	Accessory Assy	CEA4850	11	Polyethylene Bag	CEG-162
2	Screw Assy	CEA3849	12	Carton	CHG5631
3	*****		13	Contain Box	CHL5631
4	Screw	CBA1650	14	Protector	CHP2664
* 5	Polyethylene Bag	CEG-127	15	Protector	CHP2868
6	Screw	CRZ50P090FTC	16-1	Owner's Manual	CRD4029
7	Screw	TRZ50P080FTC	16-2	Installation Manual	CRD4030
* 8	Polyethylene Bag	CEG-158	16-3	Caution Card	CRP1310
9	Handle	CNC5395	17	Cord Assy	XDE7008
10	Bush	CNV3930	18	Case Assy	CXB3520

Owner's Manual,Installation Manual

<u>Part No.</u>	<u>Language</u>
CRD4029	English, Spanish, Portuguese(B), Traditional Chinese, Arabic
CRD4030	English, Spanish, Portuguese(B), Traditional Chinese, Arabic

2.3 EXTERIOR



(1) EXTERIOR SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.	
1	Screw	BSZ26P060FTC				
2	Screw	BSZ26P100FTC	31	Cover	CNM6276	A
3	Cord Assy	XDE7008	32	Panel	CNS8404	
4	*****		33	Arm	CNV4692	
5	Cable	CDE7985	34	Arm	CNV4728	
			35	Arm	CNV5576	
6	Case	CNB2793	36	Screw	IMS20P030FTB	
7	Holder	CNC8659	37	Detach Grille Assy	See Contrast table(2)	
8	Insulator	CNM9145	38	Screw	BPZ20P100FTB	
9	Tuner Amp Unit	See Contrast table(2)	39	Button(DETACH)	CAC9382	
10	Screw	ASZ26P060FTC	40	Button(VOLUME(+/-))	See Contrast table(2)	
11	Screw	BMZ26P160FTC	41	Button(CLOCK,1-6,LOCAL/BSM,AUDIO)	CAC9385	B
12	Screw	BPZ26P080FTC	42	Button(↑,→,EJECT)	CAC9386	
⚠ 13	Fuse(10 A)	CEK1208	43	Button(↓,←)	CAC9387	
14	Pin Jack(CN352)	CKB1059	44	Button(EQ,DISPLAY)	CAC9388	
15	Plug(CN901)	CKM1376	45	Button(SOURCE,BAND)	See Contrast table(2)	
16	Connector(CN831)	CKS3581	46	Spring	CBH2210	
17	Connector(CN651)	CKS3834	47	Cover	CNS8367	
18	*****		48	LCD	See Contrast table(2)	
19	Antenna Jack(CN401)	CKX1056	49	Connector(CN1801)	CKS3580	
20	Holder	CND2414	50	Holder	CND2949	C
21	Holder	CND2413	51	Transistor(Q911,921,991)	2SD2396	
22	Heat Sink	CNR1762	52	IC(IC302)	PAL007B	
23	FM/AM Tuner Unit	CWE1952	53	Lighting Conductor	CNV8712	
24	Holder	CND1054	54	Rubber	CNV8713	
25	Button(DETACH)	CAC4836	55	Connector	CNV8714	
26	Spring	CBH1835	56	Grille Unit	See Contrast table(2)	
27	Spring	CBH2208	57	Chassis Unit	CXC3600	
28	Spring	CBH2367	58	CD Mechanism Module(S10.5)	CXK5752	
29	Bracket	CNC6791	59	Panel	See Contrast table(2)	D
30	Holder	CNC8042				

(2) CONTRAST TABLE

DEH-2800MP/XN/UC and DEH-2850MP/XN/ES are constructed the same except for the following:

Mark	No.	Description	DEH-2800MP/XN/UC	DEH-2850MP/XN/ES
	9	Tuner Amp Unit	CWN1275	CWN1276
	37	Detach Grille Assy	CXC5244	CXC5245
	40	Button(VOLUME(+/-))	CAC9751	CAC9383
	45	Button(SOURCE, BAND)	CAC9752	CAC9384
	48	LCD	CAW1906	CAW1905
	56	Grille Unit	CXC5277	CXC5279
	59	Panel	CNS8389	CNS8385

△



 (2) : GEM1045

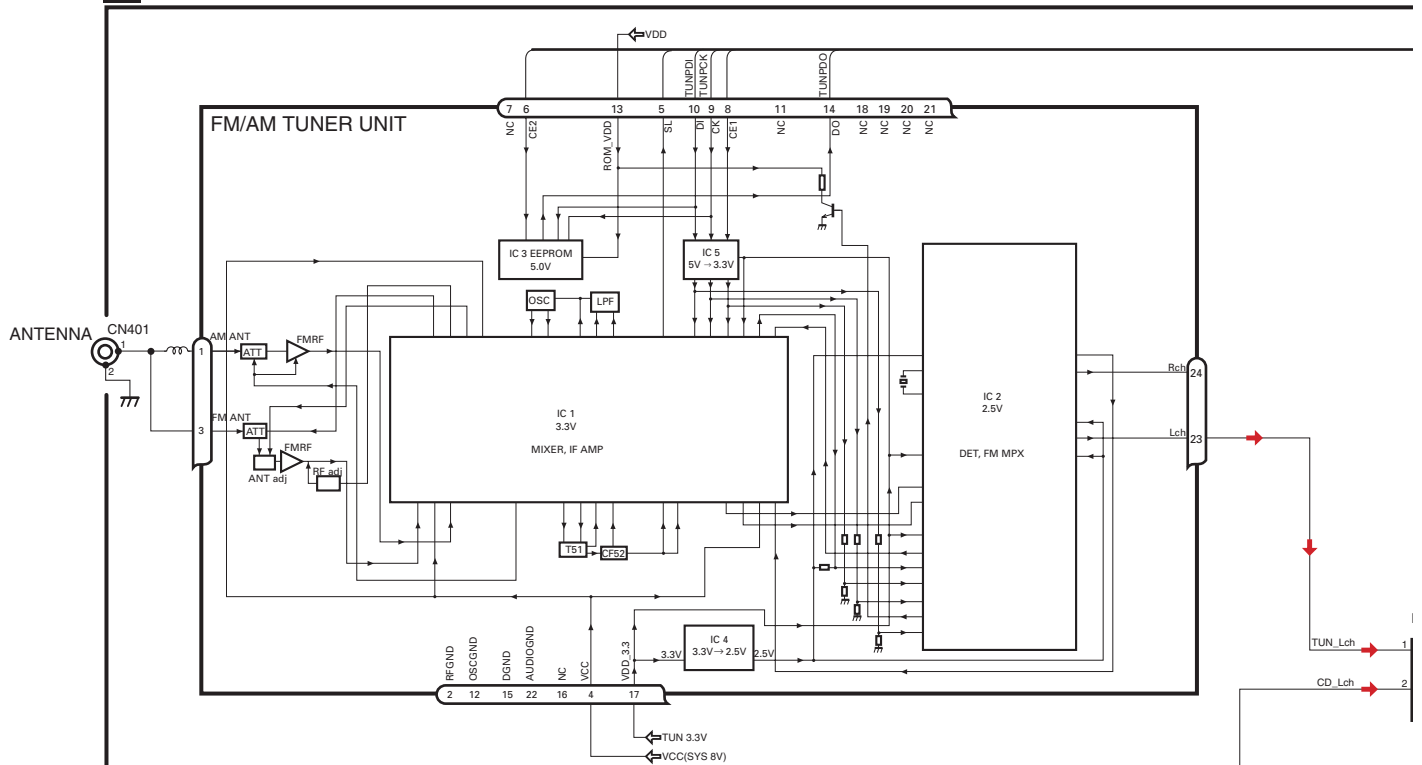
CD MECHANISM MODULE SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.	
1	CD Core Unit(S10.5COMP1)	CWX3176	50	Rack	CNV8342	
2	Connector(CN101)	CKS4182				A
3	Connector(CN901)	CKS5284	51	Roller	CNV8343	
4	Screw	BMZ20P025FTC	52	Holder	CNV8344	
5	Screw	BSZ20P040FTC	53	Arm	CNV8345	
			54	Guide	CNV8347	
6	Screw(M2 x 3)	CBA1511	55	Arm	CNV8348	
7	Screw(M2 x 4)	CBA1835				
8	Washer	CBF1038	56	Arm	CNV8349	
9	*****		57	Arm	CNV8350	
10	Spring	CBH2609	58	Clamper	CNV8365	
			59	Arm	CNV8386	
11	Spring	CBH2612	60	Guide	CNV8396	B
12	Spring	CBH2614				
13	Spring	CBH2616	61	Arm	CNV8413	
14	Spring	CBH2617	62	Collar	CNV8938	
15	Spring	CBH2620	63	Motor Unit(M2)	CXC4026	
			64	Arm Unit	CXC4027	
16	Spring	CBH2855	65	Chassis Unit	CXC4028	
17	Spring	CBH2937				
18	Spring	CBH2735	66	Gear Unit	CXC4029	
19	Spring	CBH2854	67	Frame Unit	CXC4031	
20	Spring	CBH2642	68	Motor Unit(M1)	CXC6742	
			69	Screw Unit	CXC6359	C
21	Spring	CBH2856	70	Screw	JFZ20P020FTC	
22	Spring	CBH2857				
23	Spring	CBH2860	71	Screw	JGZ17P022FTC	
24	Spring	CBH2861	72	Washer	YE20FTC	
25	Spring	CBL1686	73	Pickup Unit(P10.5)(Service)	CXX1942	
			74	Screw	IMS26P030FTC	
26	Arm	CND1909				
27	Frame	CND2582				
28	Bracket	CND2583				
29	Arm	CND2584				
30	Lever	CND2585				D
31	Arm	CND2586				
32	Bracket	CND2587				
33	Arm	CND2588				
34	Lever	CND2589				
35	Holder	CNV7201				
36	Gear	CNV7207				
37	Gear	CNV7208				
38	Gear	CNV7209				
39	Gear	CNV7210				E
40	Gear	CNV7211				
41	Gear	CNV7212				
42	Rack	CNV7214				
43	Arm	CNV7216				
44	Roller	CNV7218				
45	Gear	CNV7219				
46	Guide	CNV7361				
47	Gear	CNV7595				F
48	Guide	CNV7799				
49	Arm	CNV7805				

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

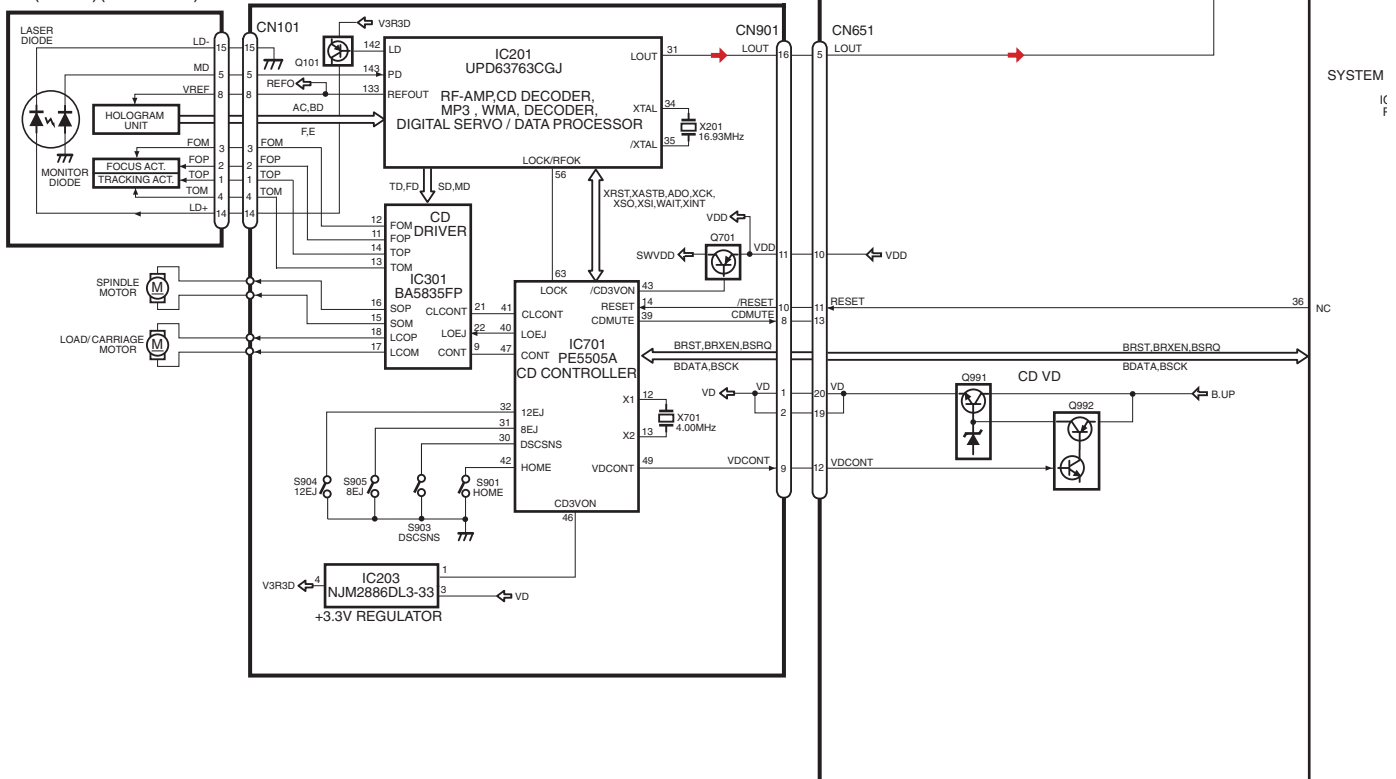
3.1 BLOCK DIAGRAM

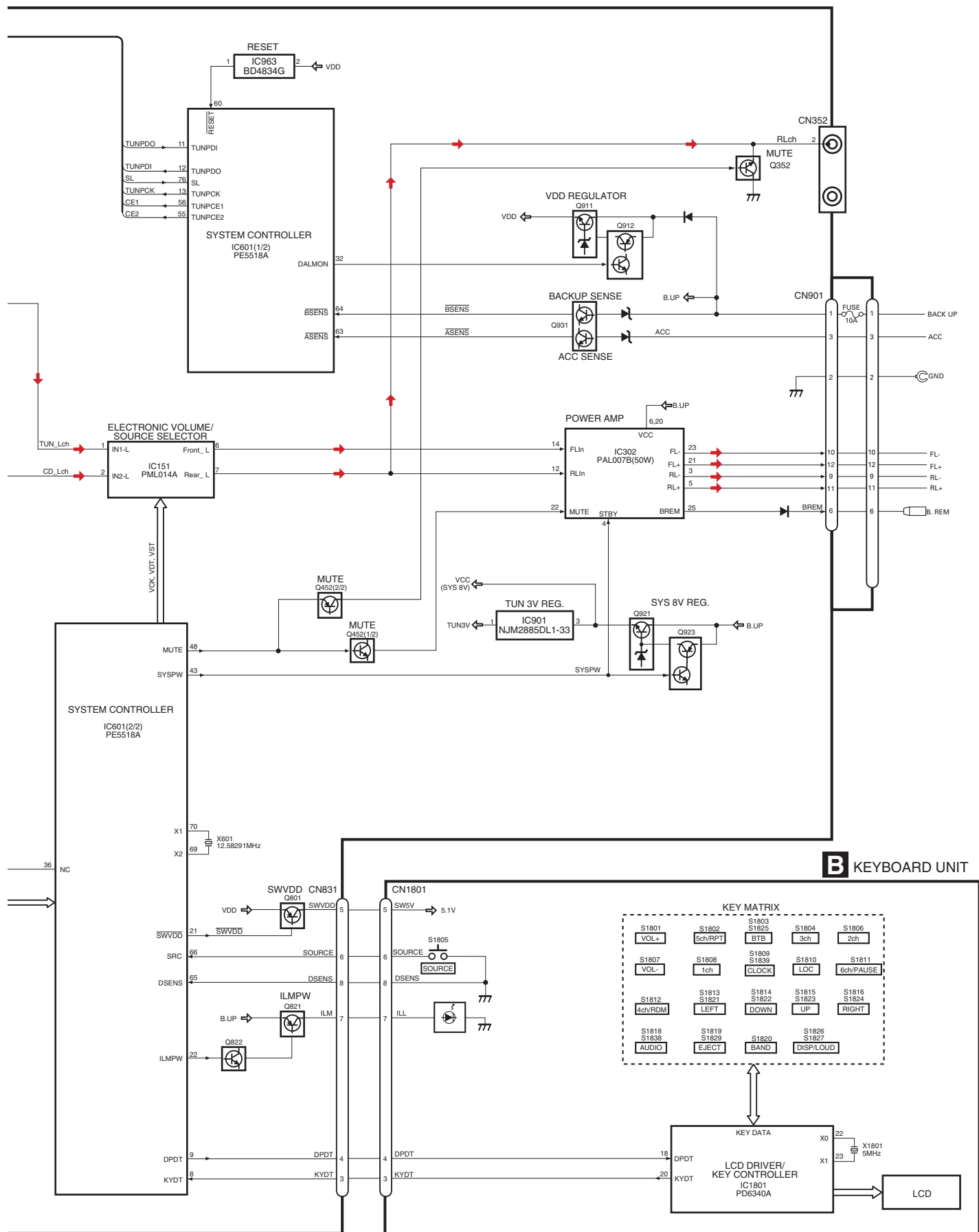
A TUNER AMP UNIT



PICKUP UNIT (P10.5)(SERVICE)

C CD CORE UNIT(S10.5COMP1)

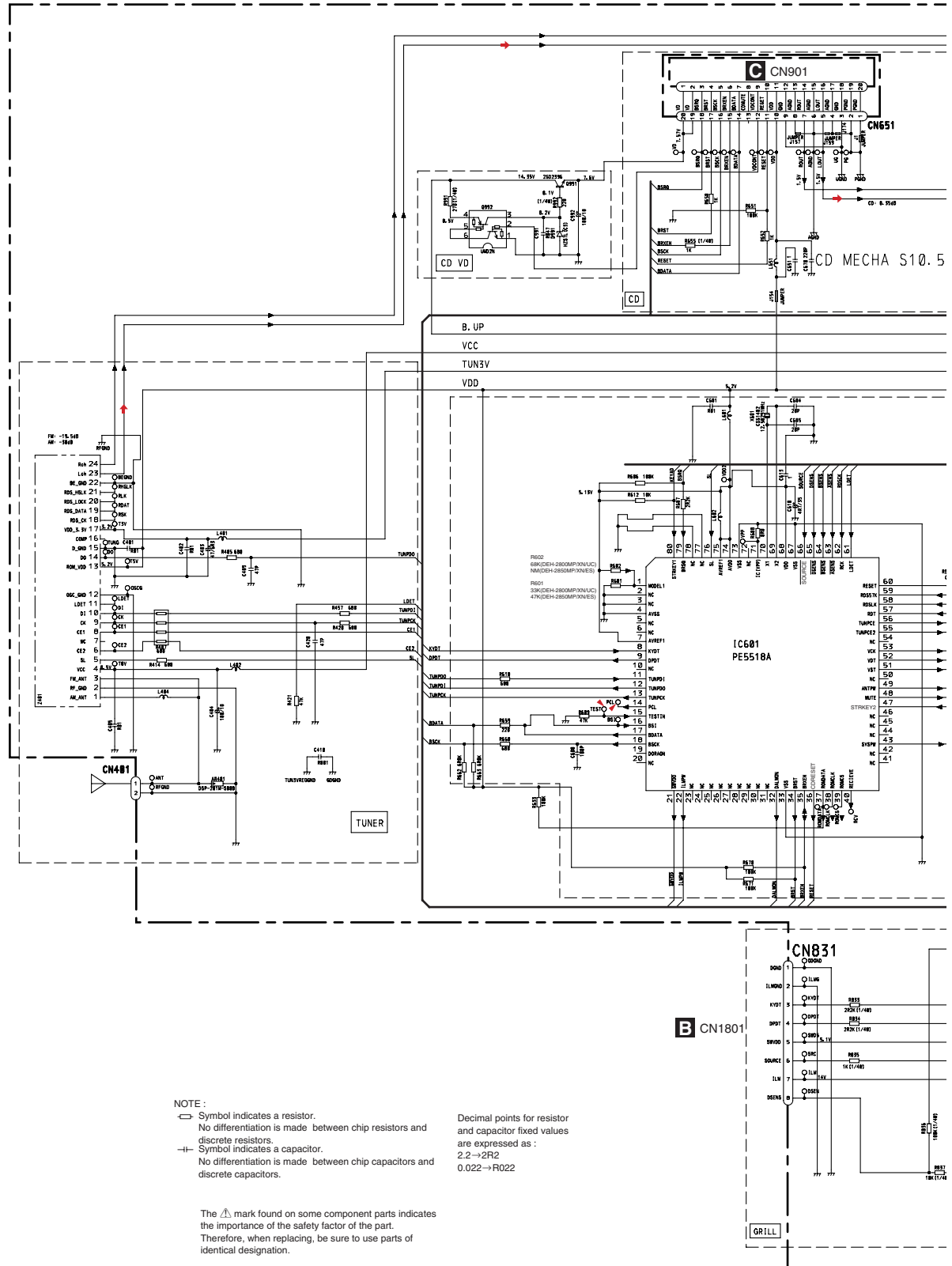
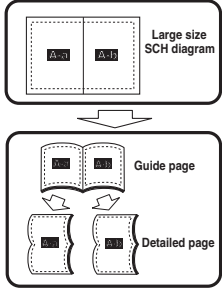




3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".

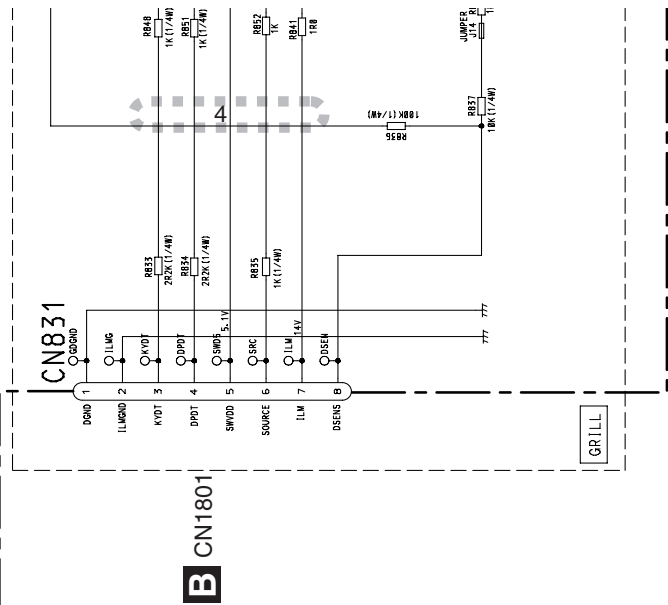
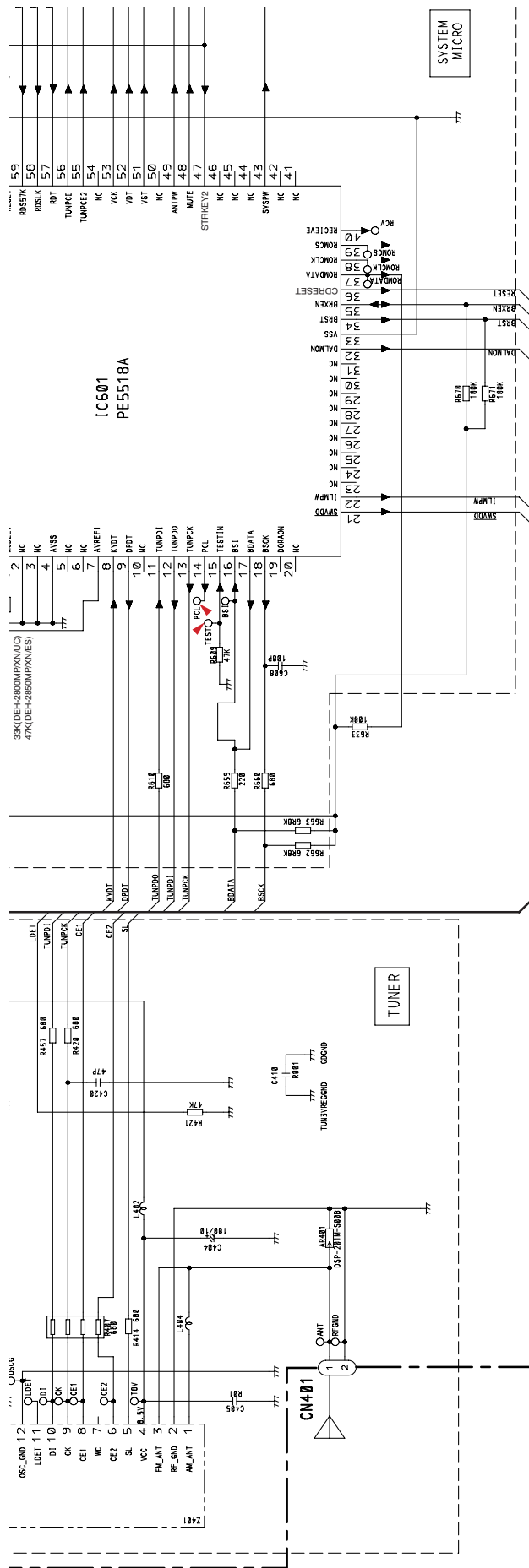
A-a





A

A-a A-b






NOTE:

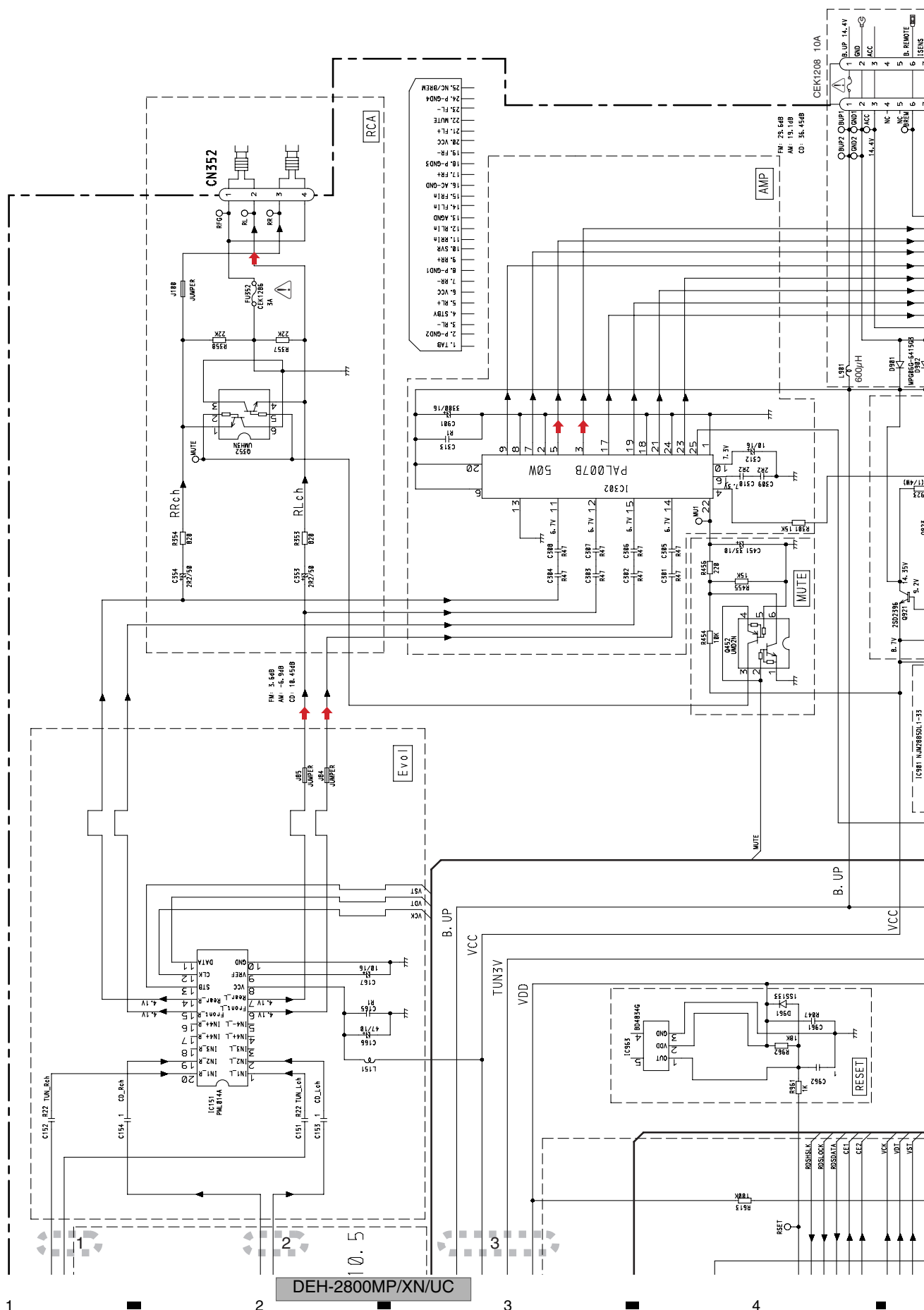
- | | |
|---|--|
|  | Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors. |
|  | Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors. |

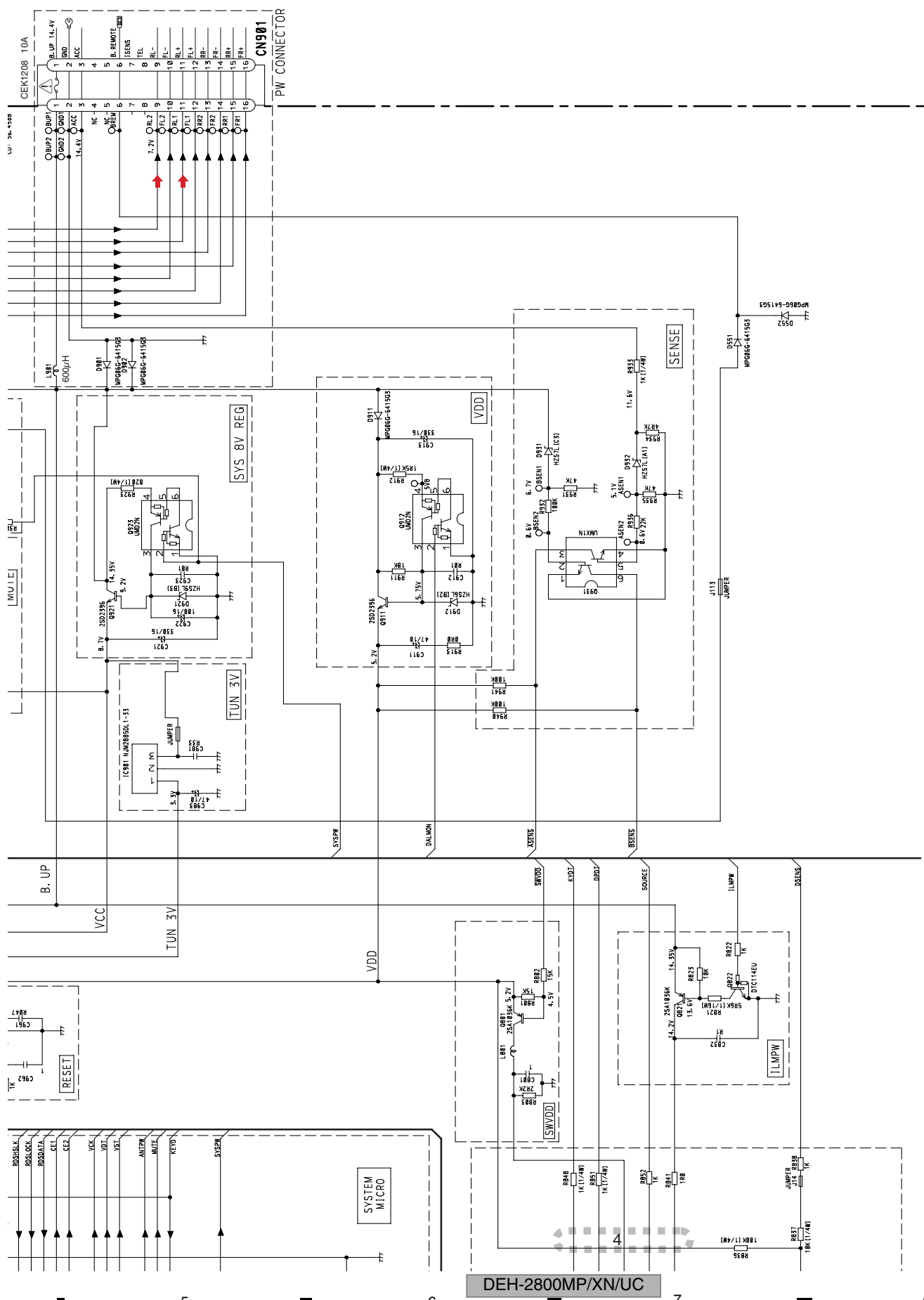
Decimal points for resistor and capacitor fixed values are expressed as :

$2.2 \rightarrow 2R2$
 $0.022 \rightarrow R022$

The  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

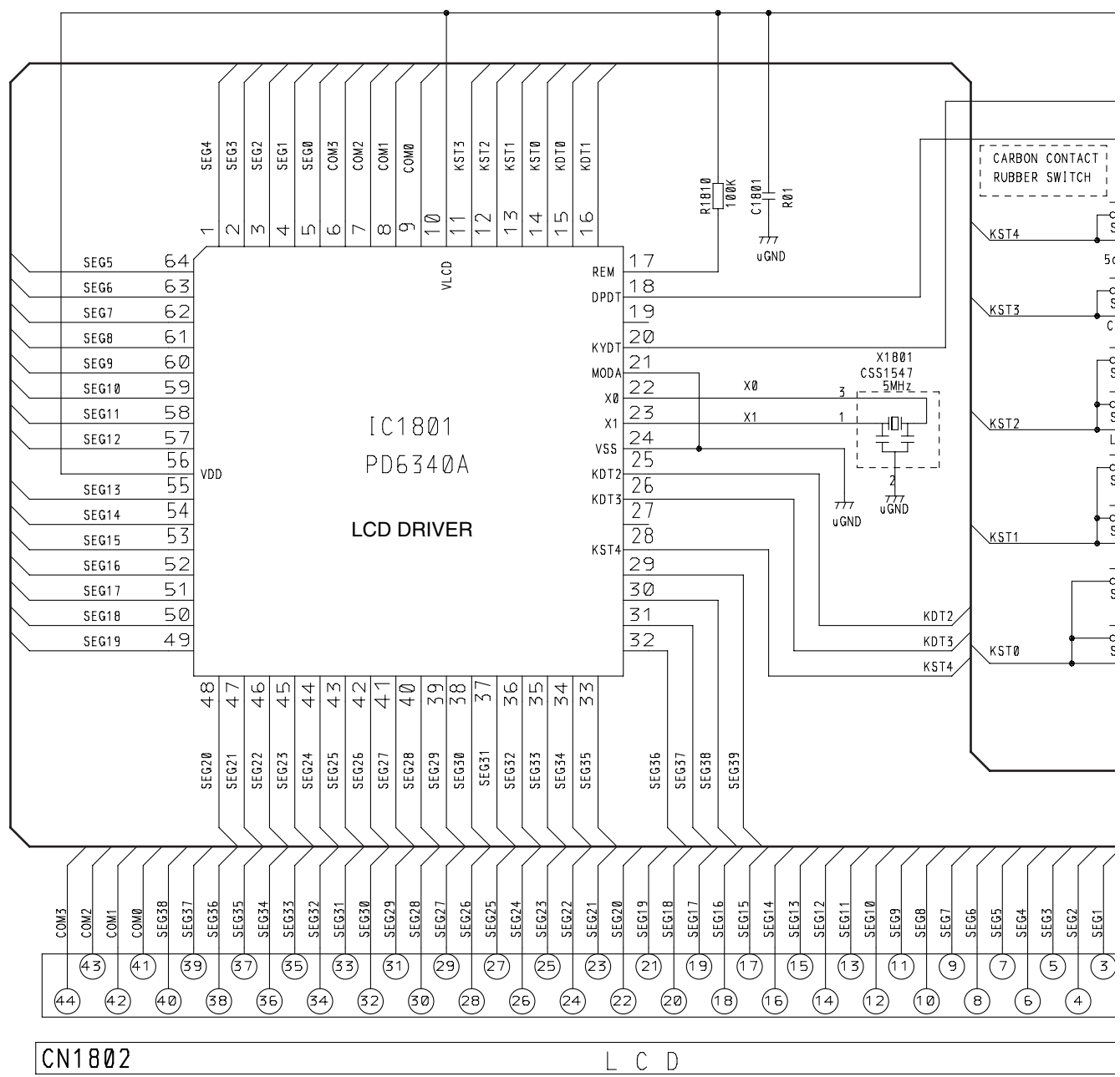
A-a	A-b
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A-b

**A-b**

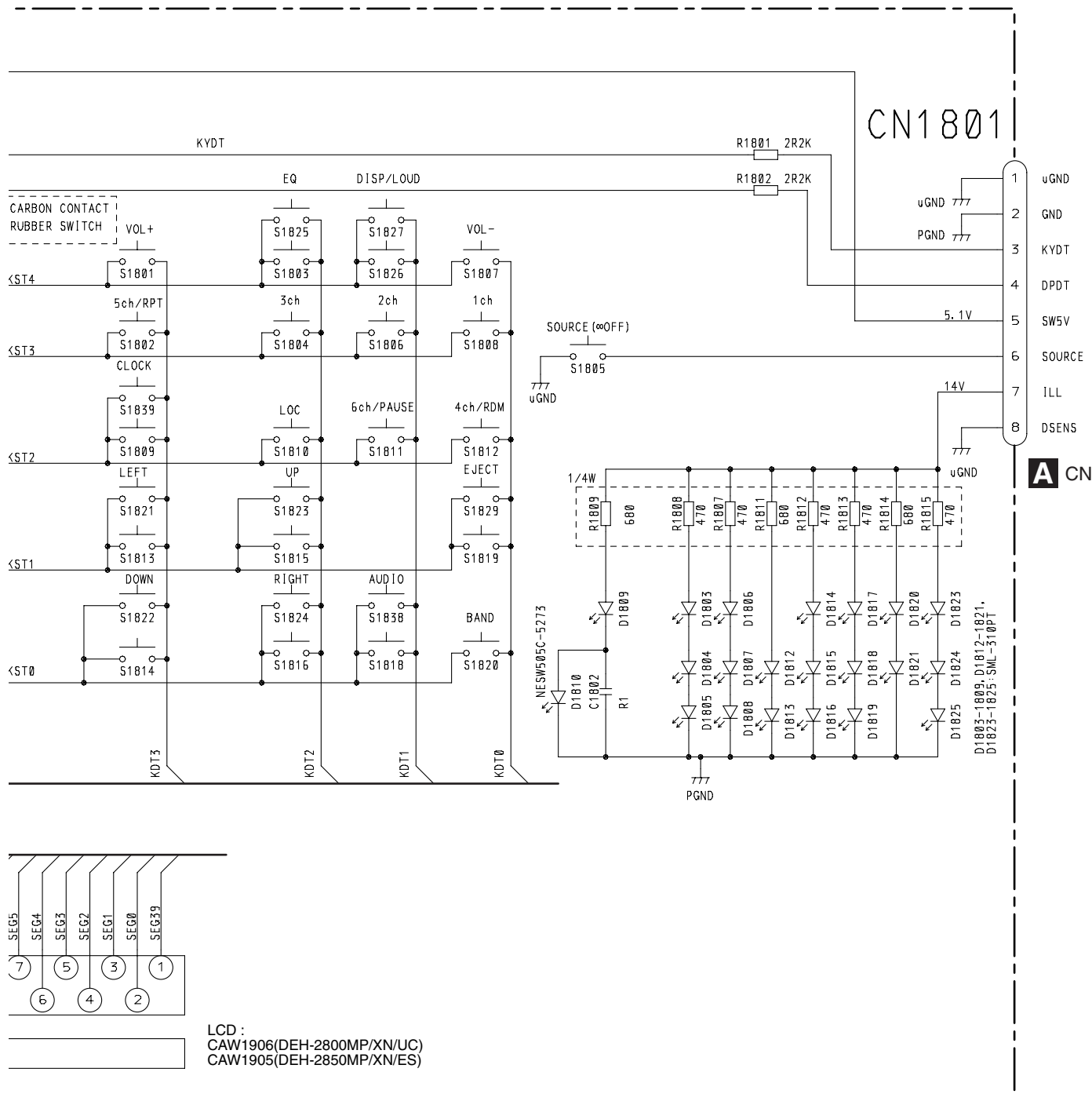
3.3 KEYBOARD UNIT

B KEYBOARD UNIT



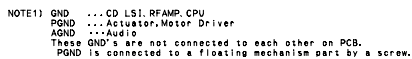
CN1802

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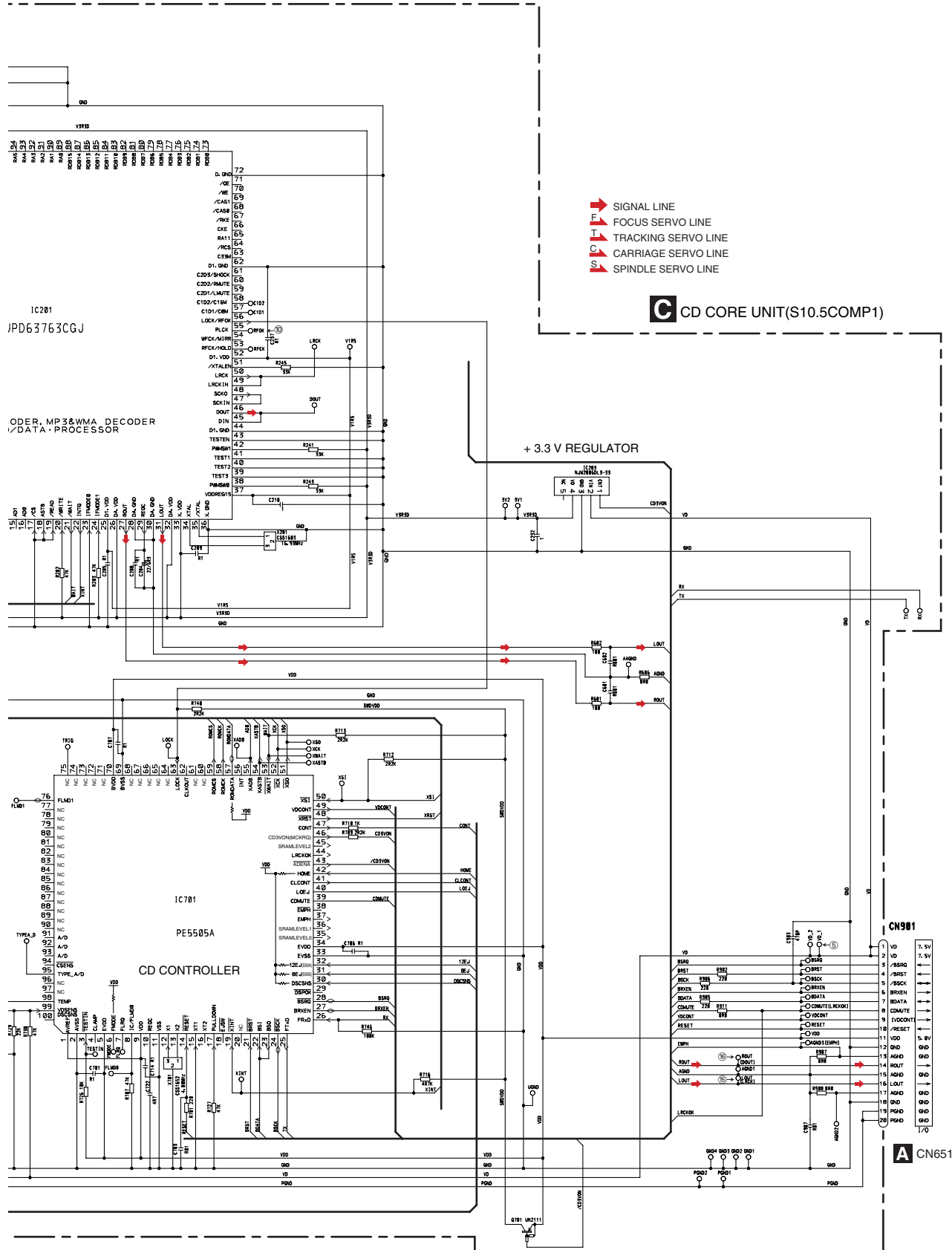


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F



C-b

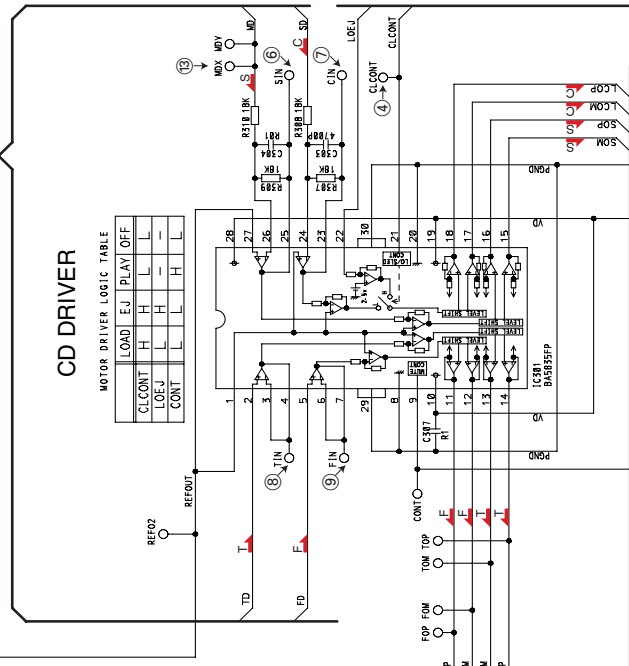


SWITCHES:
 CD CORE UNIT(S10.5COMP1) ON-OFF
 S901:HOME SWITCH.....ON-OFF
 S903:DSCSNS SWITCH.....ON-OFF
 S904:12EJ SWITCH.....ON-OFF
 S905:8EJ SWITCH.....ON-OFF

The underlined indicates the switch position.

M1 CXG6742
 SPINDLE MOTOR

M2 CXG4026
 LOADING/CARRIAGE MOTOR



Ⓑ Monitor land (ø1.2mm)
 Ⓕ Monitor land (ø0.8mm)
 □ Land for manual soldering

C-a

NOTE1) GNDCD LSI, RFAMP, CPU
 PGND ...Actuator, Motor Driver
 AGND ...Audio
 These GND's are not connected to each other on PCB.
 PGND is connected to a floating mechanism part by a screw.

C-a C-b

C-b

A

B

C

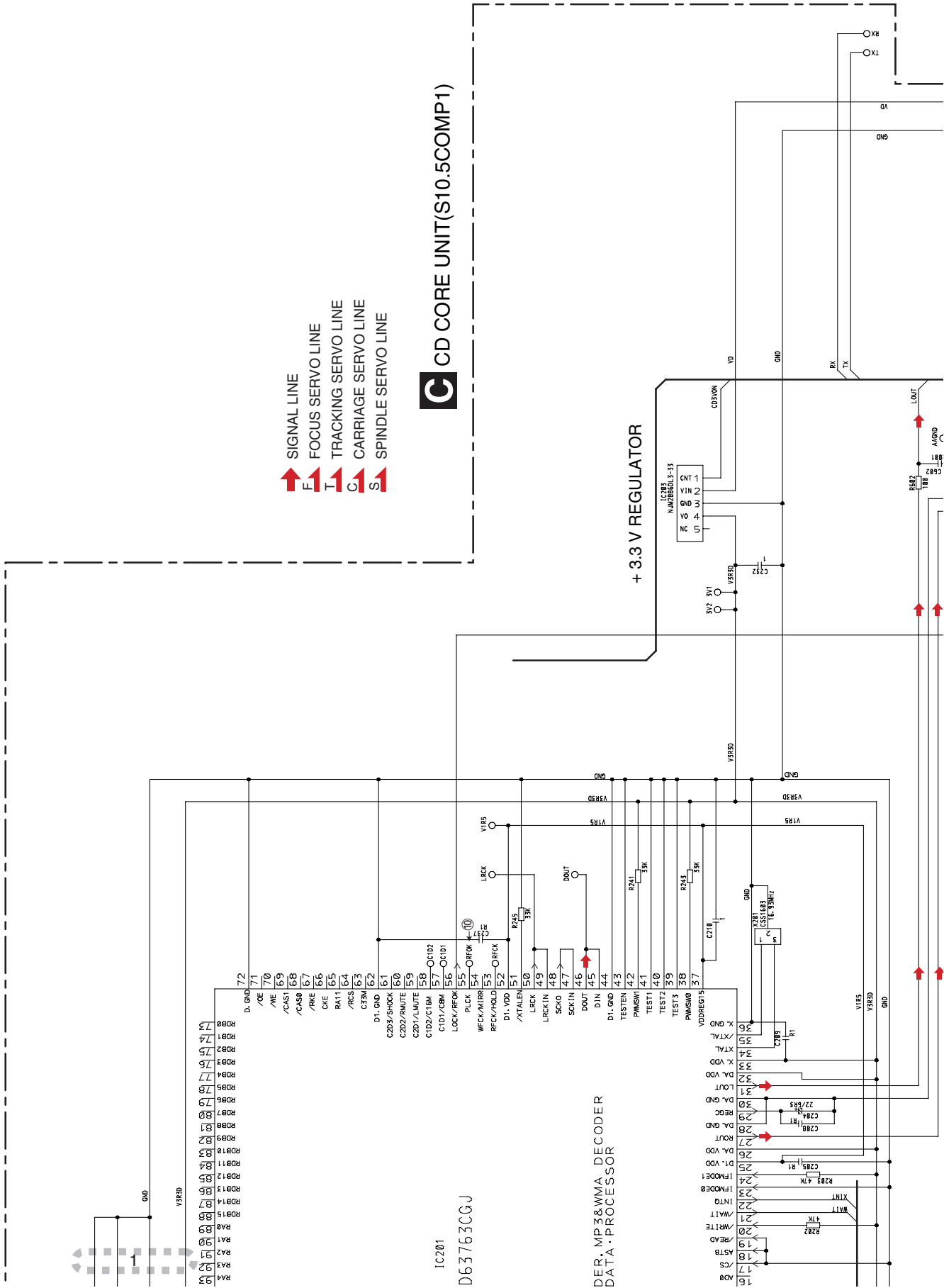
D

E

F

C-a C-b

C-b



DEH-2800MP/XN/UC

IC201
D63763CJ

DER, MP38WMA DECODER
DATA PROCESSOR

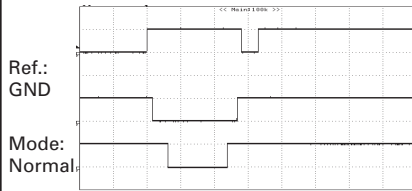
Waveforms

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65 V)

A

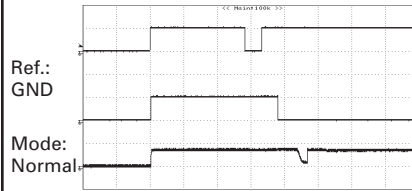
① DSCSNS 5 V/div 500 ms/div
② 8SNS 5 V/div
③ 12SNS 5 V/div

12 cm CD Loading operation



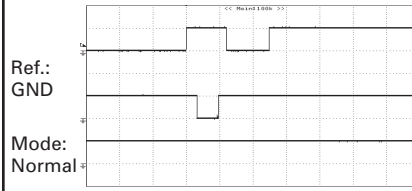
① DSCSNS 5 V/div 500 ms/div
④ CLCONT 5 V/div
⑤ VD 10 V/div

12 cm CD Loading operation



① DSCSNS 5 V/div 500 ms/div
② 8SNS 5 V/div
③ 12SNS 5 V/div

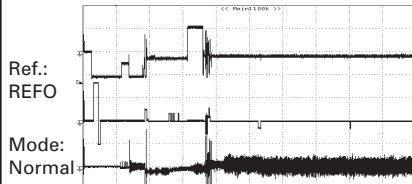
8 cm CD Loading operation



B

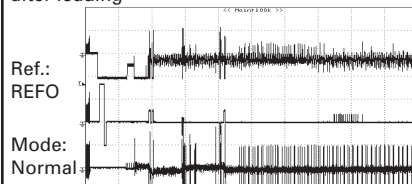
⑥ SIN 1 V/div 1 s/div
⑦ CIN 500 mV/div
⑧ TIN 500 mV/div

12 cm CD-DA setup operation after loading



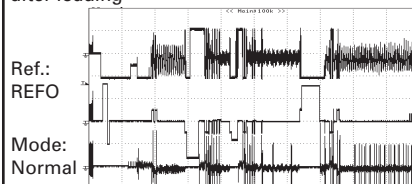
⑥ SIN 1 V/div 1 s/div
⑦ CIN 500 mV/div
⑧ TIN 500 mV/div

12 cm CD-ROM(1 session) setup operation after loading



⑥ SIN 1 V/div 1 s/div
⑦ CIN 500 mV/div
⑧ TIN 500 mV/div

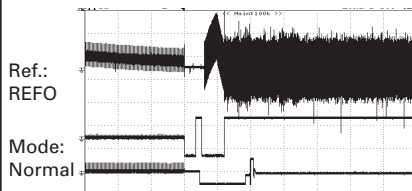
12 cm CD-ROM(3 sessions) setup operation after loading



C

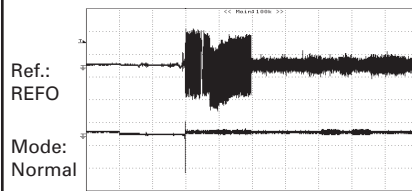
⑨ FIN 200 mV/div 500 ms/div
⑩ RFOK 2 V/div
⑥ SIN 2 V/div

12 cm CD-DA Source On setup operation



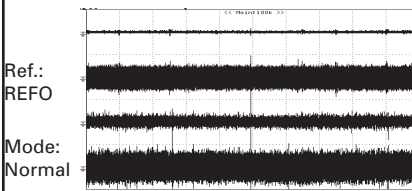
⑪ TE 500 mV/div 200 ms/div
⑫ FE 500 mV/div

Source On setup operation



⑫ FE 500 mV/div 20 ms/div
⑨ FIN 500 mV/div
⑪ TE 500 mV/div
⑧ TIN 500 mV/div

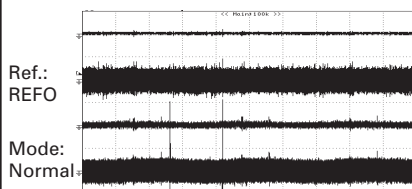
CD-DA Play operation



D

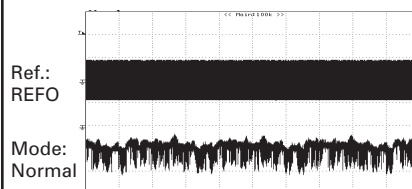
⑫ FE 500 mV/div 20 ms/div
⑨ FIN 500 mV/div
⑪ TE 500 mV/div
⑧ TIN 500 mV/div

CD-ROM play operation(Regular track Jump)



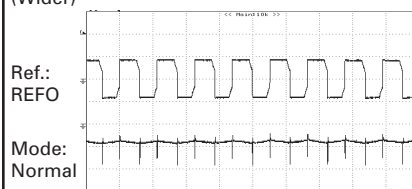
⑬ MDX 2 V/div 50 ms/div
⑥ SIN 200 mV/div

Spindle waveform during play operation



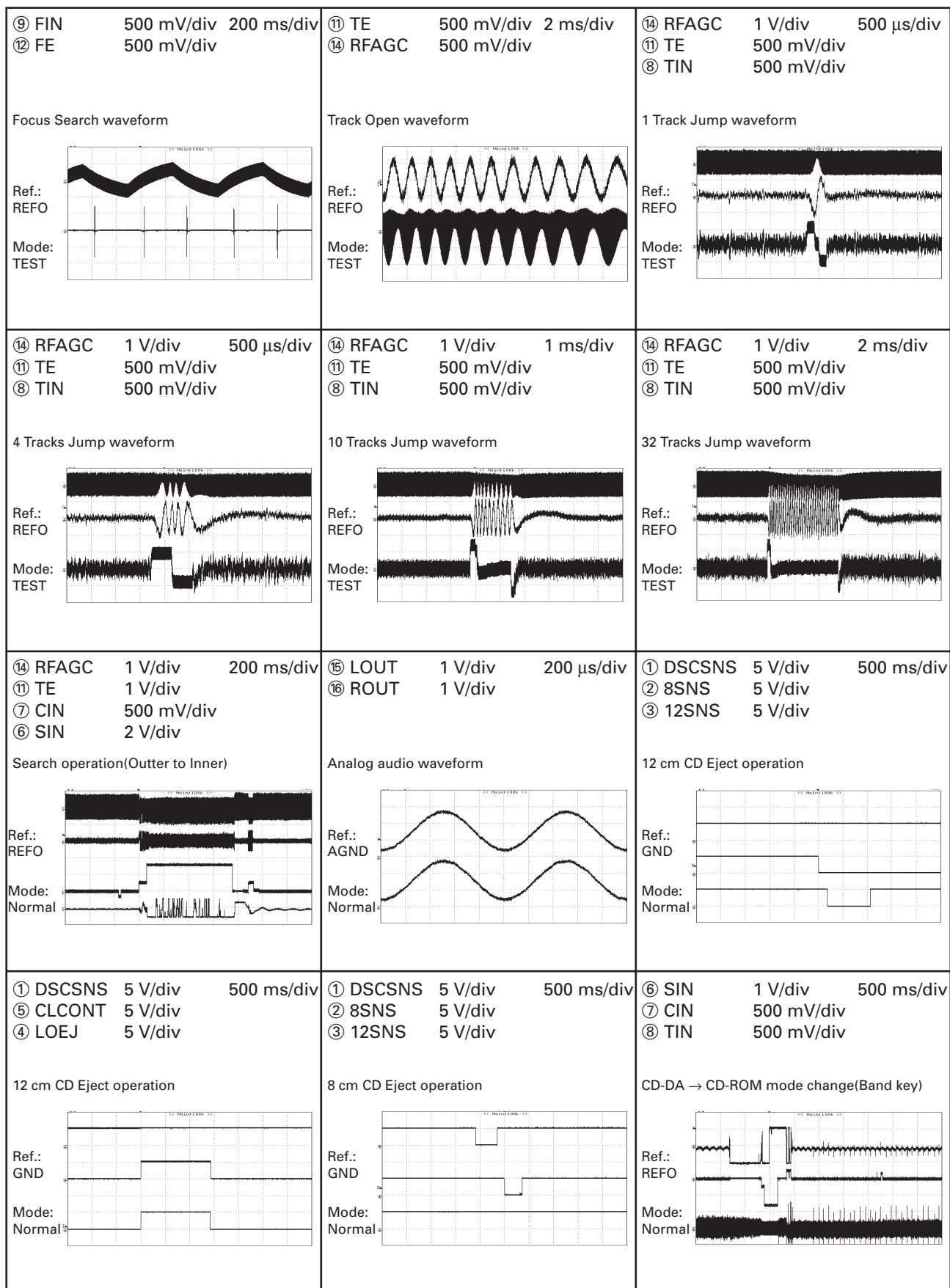
⑬ MDX 2 V/div 5 μs/div
⑥ SIN 500 mV/div

Spindle waveform during play operation (Wider)



E

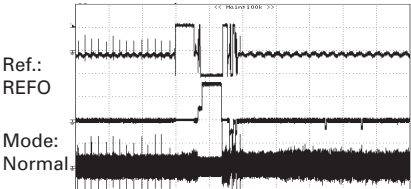
F



A

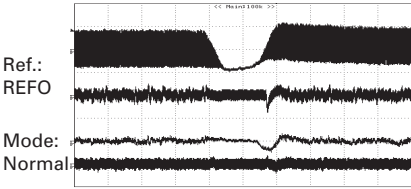
⑥ SIN 1 V/div 500 ms/div
⑦ CIN 500 mV/div
⑧ TIN 500 mV/div

CD-ROM → CD-DA mode change(Band key)



⑭ RFAGC 1 V/div 500 μs/div
⑧ TIN 1 V/div
⑪ TE 1 V/div
⑨ FIN 1 V/div

Black dot(800 μm) during play



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DEH-2800MP/XN/UC

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4. PCB CONNECTION DIAGRAM

4.1 TUNER AMP UNIT

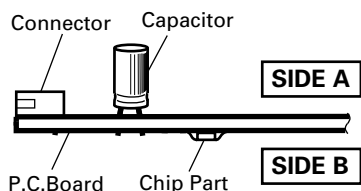
A

A TUNER AMP UNIT

NOTE FOR PCB DIAGRAMS

1.The parts mounted on this PCB include all necessary parts for several destination.
For further information for respective destinations, be sure to check with the schematic diagram.

2.Viewpoint of PCB diagrams



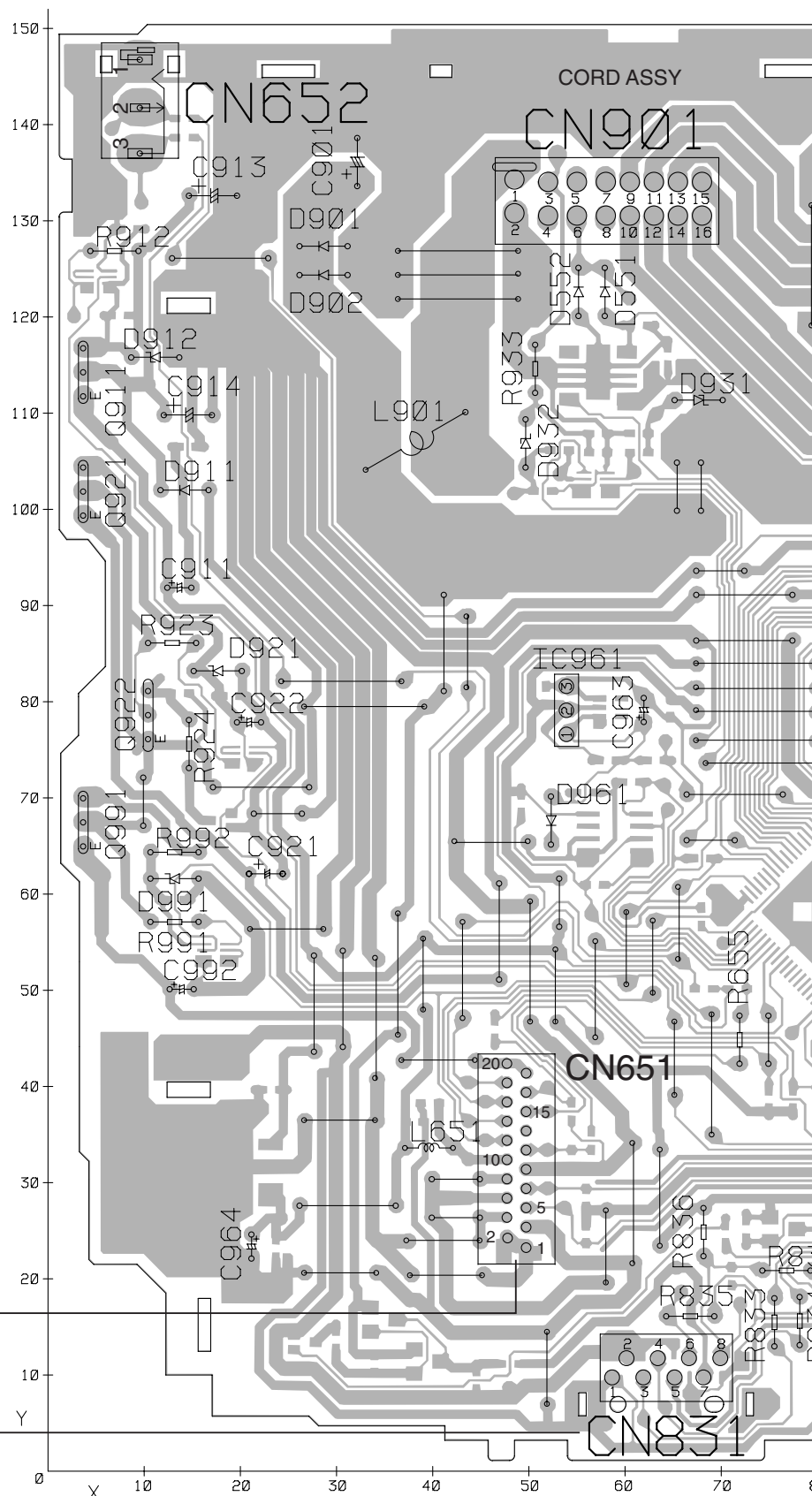
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SIDE A

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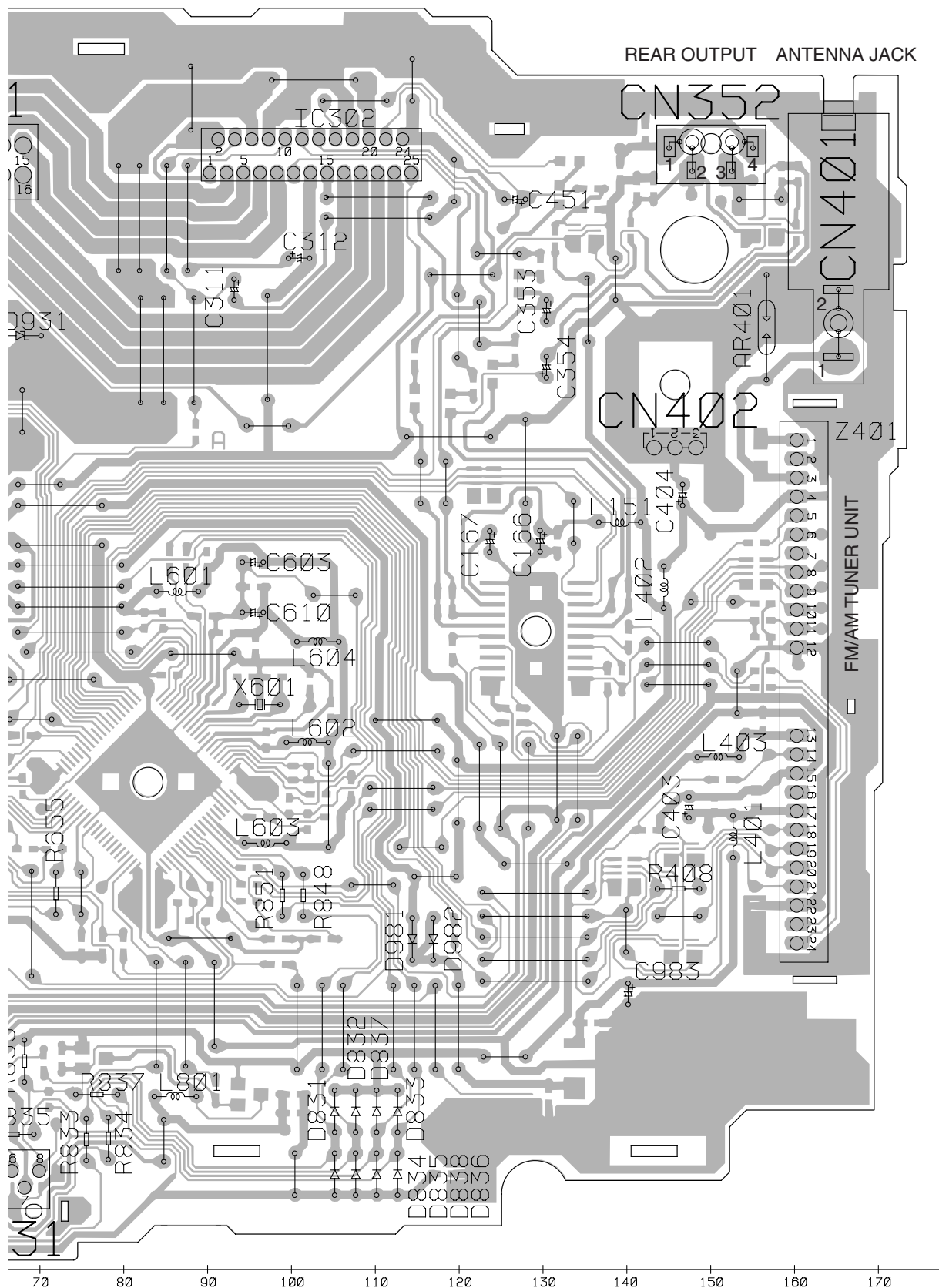
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SIDE B

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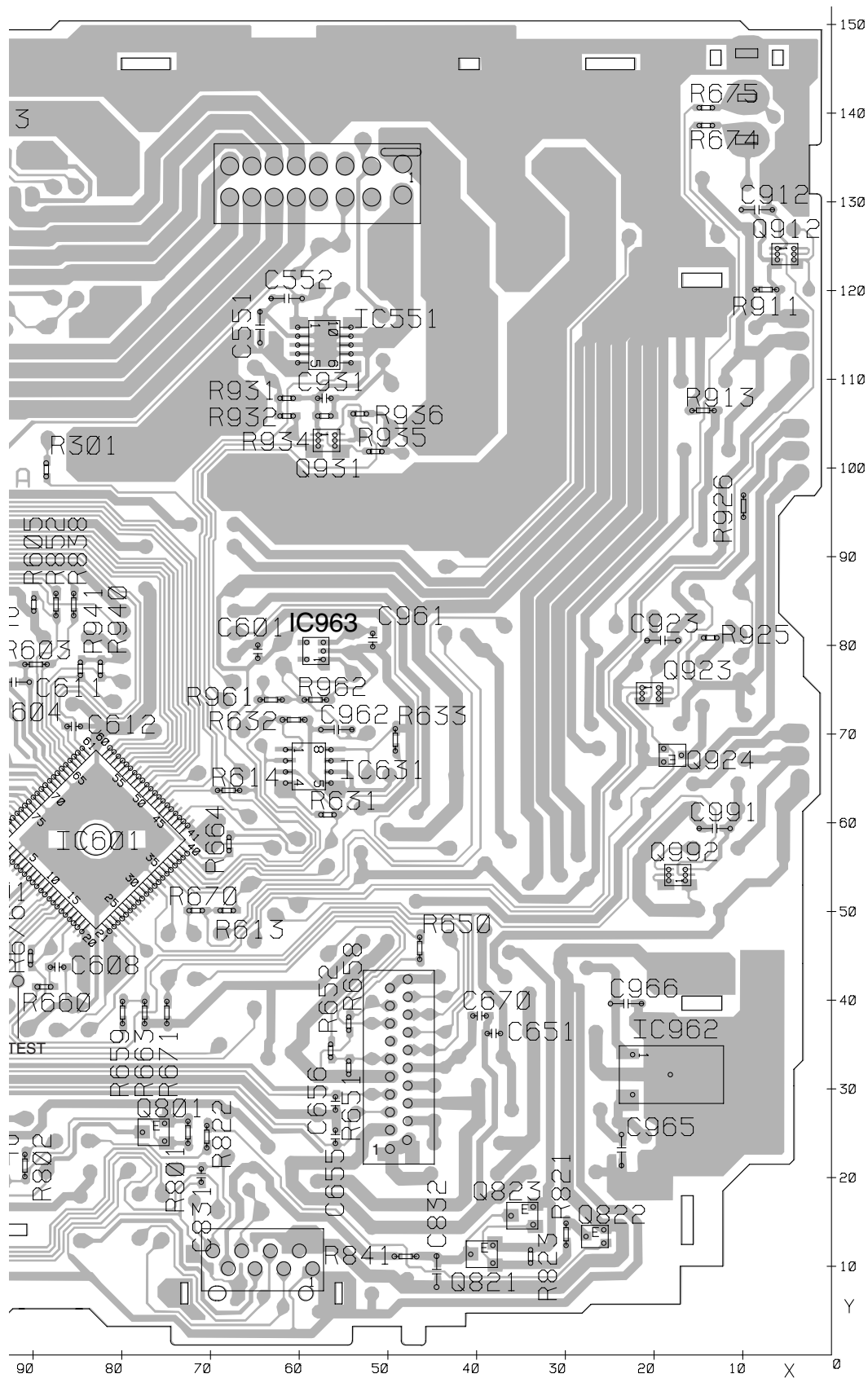
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4.2 KEYBOARD UNIT

B KEYBOARD UNIT

SIDE A

B KEYBOARD UNIT

SIDE B

A

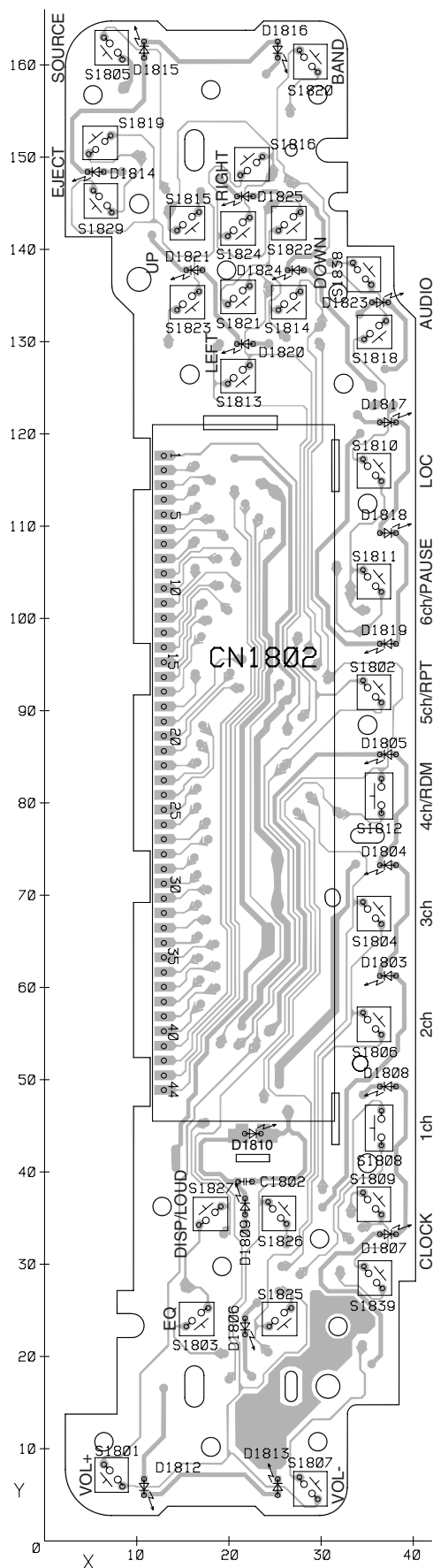
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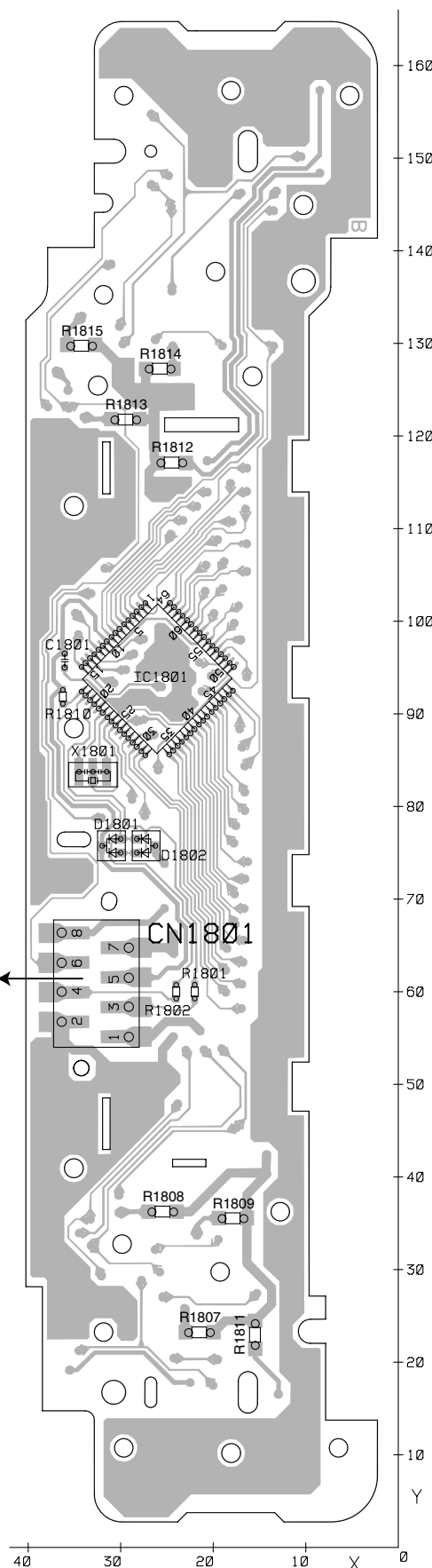
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DEH-2800MP/XN/UC

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C CD CORE UNIT(S10.5COMP1)

SIDE B

A

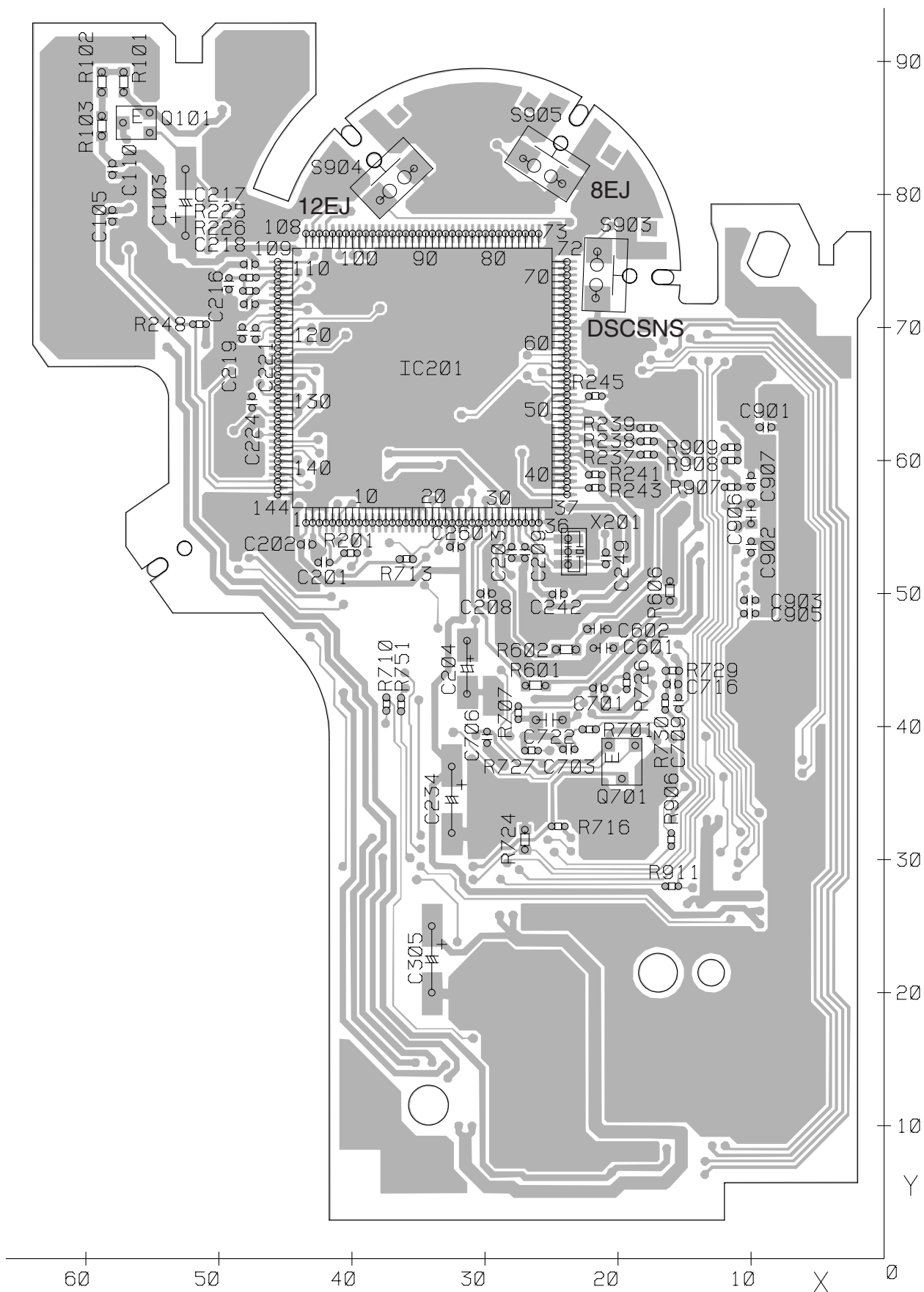
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5. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○○J,RS1/○○S○○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

- The \triangle mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Meaning of the figures and others in the parentheses in the parts list.

Example) IC 301 is on the point (face A, 91 of x-axis, and 111 of y-axis) of the corresponding PC board.

IC 301 (A, 91, 111) IC NJM2068V

Circuit Symbol and No. Part No.
Unit Number: CWN1275(DEH-2800MP/XN/UC)

Unit Number: CWN1276(DEH-2850MP/XN/ES)

Unit Name : Tuner Amp Unit

Unit Number:

Unit Name : Keyboard Unit

Unit Number: CWX3176

Unit Name : CD Core

Unit(S10.5COMP1)

A

Unit Number: CWN1275(DEH-2800MP/XN/UC)

Unit Number: CWN1276(DEH-2850MP/XN/ES)

Unit Name : Tuner Amp Unit

MISCELLANEOUS

IC 151	(B,133,80) IC	PML014A
IC 302	(A,94,135) IC	PAL007B
IC 601	(B,87,62) IC	PE5518A
IC 901	(B,143,29) IC	NJM2885DL1-33
IC 963	(B,62,83) IC	BD4834G

Q 352	(B,160,129) Transistor	UMH3N
Q 452	(B,139,128) Transistor	UMD2N
Q 801	(B,80,29) Transistor	2SA1036K
Q 821	(B,43,15) Transistor	2SA1036K
Q 822	(B,31,17) Transistor	DTC114EU

Q 911	(A,8,116) Transistor	2SD2396
Q 912	(B,9,128) Transistor	UMD2N
Q 921	(A,8,103) Transistor	2SD2396
Q 923	(B,24,79) Transistor	UMD2N

Circuit Symbol and No.	Part No.
Q 931 (B,61,107) Transistor	UMX1N
Q 991 (A,8,69) Transistor	2SD2396
Q 992 (B,21,58) Transistor	UMD2N
D 551 (A,62,124) Diode	MPG06G-6415G3
D 552 (A,59,124) Diode	MPG06G-6415G3
D 901 (A,35,131) Diode	MPG06G-6415G3
D 902 (A,35,128) Diode	MPG06G-6415G3
D 911 (A,21,106) Diode	MPG06G-6415G3
D 912 (A,18,120) Diode	HZS6L(B2)
D 921 (A,24,87) Diode	HZS9L(B3)
D 931 (A,69,115) Diode	HZS7L(C3)
D 932 (A,54,108) Diode	HZS7L(A1)
D 961 (A,56,74) Diode	1SS133
D 991 (A,20,66) Diode	HZS7L(C3)
L 151 (A,146,93) Inductor	LAU2R2K
L 401 (A,157,58) Inductor	LAU2R2K
L 402 (A,148,88) Inductor	LAU2R2K
L 404 (B,160,101) Inductor	LCTAW220J2520
L 601 (A,93,85) Ferri-Inductor	LAU100K
L 602 (A,103,67) Inductor	LAU2R2K
L 651 (A,41,38) Ferri-Inductor	LAU100K
L 801 (A,88,25) Inductor	LAU2R2K
L 901 (A,36,108) Choke Coil 600μH	CTH1280
X 601 (A,103,71) Radiator 12.58291MHz	CSS1402
\triangle FU352 (B,143,135) Fuse 3A	CEK1286
\triangle Fuse 10A	CEK1208
AR401 (A,161,110) Arrester FM/AM Tuner Unit	DSP-201M-S00B CWE1952

RESISTORS

R 301 (B,93,104)	RS1/16S153J
R 353 (B,144,128)	RS1/16S821J
R 354 (B,164,128)	RS1/16S821J
R 357 (B,145,133)	RS1/16S223J
R 358 (B,164,135)	RS1/16S223J
R 405 (B,155,62)	RS1/16S681J
R 407 (B,159,87)	RAB4C681J
R 414 (B,159,91)	RS1/16S681J
R 420 (B,99,48)	RS1/16S681J
R 421 (B,160,79)	RS1/16S473J

5			6			7			8		
<u>Circuit Symbol and No.</u>			<u>Part No.</u>			<u>Circuit Symbol and No.</u>			<u>Part No.</u>		
R 454	(B,135,127)		RS1/16S103J			C 151	(B,160,73)		CKSRYB224K10		
R 455	(B,140,130)		RS1/16S153J			C 152	(B,160,75)		CKSRYB224K10		
R 456	(B,140,133)		RS1/16S221J			C 153	(B,130,69)		CKSRYB105K6R3		A
R 457	(B,99,50)		RS1/16S681J			C 154	(B,142,74)		CKSRYB105K6R3		
R 601	(B,100,58) (DEH-2800MP/XN/UC)		RS1/16S333J			C 165	(B,136,91)		CKSRYB104K16		
R 601	(B,100,58) (DEH-2850MP/XN/ES)		RS1/16S473J			C 166	(A,134,92)		CEJQ470M10		
R 602	(B,109,58) (DEH-2800MP/XN/UC)		RS1/16S683J			C 167	(A,128,92)		CEJQ100M16		
R 606	(B,111,61)		RS1/16S104J			C 301	(B,119,108)		CKSQYB474K16		
R 607	(B,107,61)		RS1/16S222J			C 302	(B,128,111)		CKSQYB474K16		
R 608	(B,106,74)		RS1/16S0R0J			C 303	(B,131,122)		CKSQYB474K16		
R 609	(B,102,43)		RS1/16S473J			C 304	(B,123,107)		CKSQYB474K16		
R 610	(B,99,52)		RS1/16S681J			C 305	(B,119,113)		CKSRYB474K10		
R 612	(B,106,57)		RS1/16S103J			C 306	(B,131,114)		CKSRYB474K10		
R 613	(B,72,54)		RS1/16S104J			C 307	(B,134,124)		CKSRYB474K10		B
R 633	(B,53,73)		RS1/16S104J			C 308	(B,126,109)		CKSRYB474K10		
R 650	(B,50,50)		RS1/16S102J			C 309	(B,136,132)		CKSQYB225K10		
R 651	(B,58,36)		RS1/16S104J			C 310	(B,137,136)		CKSQYB225K10		
R 652	(B,60,38)		RS1/16S102J			C 312	(A,104,125)		CEJQ100M16		
R 655	(A,76,51)		RD1/4PU102J			C 313	(B,100,142)		CKSRYB104K16		
R 659	(B,84,43)		RS1/16S221J			C 353	(A,134,120)		CEJQ2R2M50		
R 660	(B,93,46)		RS1/16S681J			C 354	(A,134,110)		CEJQ2R2M50		
R 662	(B,102,40)		RS1/16S682J			C 401	(B,160,69)		CKSRYB103K50		
R 663	(B,81,43)		RS1/16S682J			C 402	(B,154,59)		CKSRYB103K50		
R 670	(B,76,54)		RS1/16S104J			C 403	(A,151,58)		CEJQ470M6R3		
R 671	(B,79,43)		RS1/16S104J			C 404	(A,151,95)		CEJQ101M10		C
R 801	(B,77,29)		RS1/16S153J			C 405	(B,167,97)		CKSRYB103K50		
R 802	(B,95,25)		RS1/16S153J			C 409	(B,147,56)		CCSRCH470J50		
R 803	(B,104,23)		RS1/16S222J			C 410	(B,122,15)		CKSRYB102K50		
R 821	(B,34,18)		RS1/16S562J			C 420	(B,108,43)		CCSRCH470J50		
R 822	(B,74,29)		RS1/16S102J			C 451	(A,132,132)		CEJQ330M10		
R 823	(B,38,15)		RS1/16S103J			C 601	(B,69,83)		CKSRYB103K50		
R 833	(A,80,17)		RD1/4PU222J			C 604	(B,98,75)		CCSRCH200J50		
R 834	(A,82,17)		RD1/4PU222J			C 605	(B,102,75)		CCSRCH200J50		
R 835	(A,68,20)		RD1/4PU102J			C 608	(B,91,48)		CCSRCH101J50		
R 836	(A,72,26)		RD1/4PU104J			C 610	(A,101,82)		CEJQ4R7M35		
R 837	(A,78,25)		RD1/4PU103J			C 613	(B,100,78)		CKSRYB105K6R3		D
R 838	(B,89,89)		RS1/16S102J			C 651	(B,42,40)		CKSRYB105K10		
R 841	(B,52,15)		RS1/16S1R0J			C 670	(B,44,42)		CCSRCH221J50		
R 848	(A,105,46)		RD1/4PU102J			C 801	(B,104,25)		CKSRYB105K6R3		
R 851	(A,103,46)		RD1/4PU102J			C 832	(B,49,13)		CKSRYB104K16		
R 852	(B,91,89)		RS1/16S102J			C 901	(A,36,140)		CEAT332M16(P45)		
R 911	(B,11,124)		RS1/16S183J			C 911	(A,16,96)		CEJQ470M10		
R 912	(A,8,131)		RD1/4PU152J			C 912	(B,12,133)		CKSRYB103K50		
R 913	(B,18,110)		RS1/16S0R0J			C 913	(A,19,137)		CEAT331M16		
R 923	(A,19,90)		RD1/4PU821J			C 921	(A,25,66) 330μF/16V		CCH1326		
R 931	(B,65,112)		RS1/16S473J			C 922	(A,24,82)		CEJQ101M16		E
R 932	(B,65,110)		RS1/16S104J			C 923	(B,23,85)		CKSRYB103K50		
R 933	(A,55,116)		RD1/4PU102J			C 961	(B,56,85)		CKSRYB473K50		
R 934	(B,61,110)		RS1/16S472J			C 962	(B,60,75)		CKSRYB105K6R3		
R 935	(B,55,106)		RS1/16S473J			C 981	(B,135,25)		CKSRYB334K10		
R 936	(B,57,110)		RS1/16S223J			C 983	(A,144,38)		CEJQ470M10		
R 940	(B,86,81)		RS1/16S104J			C 991	(B,17,63)		CKSRYB473K50		
R 941	(B,89,81)		RS1/16S104J			C 992	(A,17,54)		CEJQ101M10		
R 961	(B,67,78)		RS1/16S102J								
R 962	(B,62,78)		RS1/16S183J								
R 991	(A,20,61)		RD1/4PU271J								
R 992	(A,15,68)		RD1/4PU221J								

CAPACITORS

B

Unit Number :

Unit Name : Keyboard Unit

MISCELLANEOUS

Circuit Symbol and No.**Part No.****Circuit Symbol and No.****Part No.**

IC 1801 (B,32,100) IC PD6340A
 D 1803 (A,43,67) LED SML-310PT
 D 1804 (A,43,79) LED SML-310PT
 D 1805 (A,43,91) LED SML-310PT
 D 1806 (A,28,29) LED SML-310PT

S 904 (B,42,87) Switch(12EJ)
 S 905 (B,28,88) Switch(8EJ)

CSN1068
 CSN1068

RESISTORS

D 1807 (A,43,39) LED SML-310PT
 D 1808 (A,43,55) LED SML-310PT
 D 1809 (A,28,42) LED SML-310PT
 D 1810 (A,29,50) LED NESW505C-5273
 D 1812 (A,17,12) LED SML-310PT

R 101 (B,61,92) RS1/10SR2R4J
 R 102 (B,63,92) RS1/10SR2R4J
 R 103 (B,63,89) RS1/10SR2R7J
 R 104 (A,52,73) RS1/16SS102J
 R 201 (B,44,57) RS1/16SS102J

D 1813 (A,31,12) LED SML-310PT
 D 1814 (A,12,154) LED SML-310PT
 D 1815 (A,17,168) LED SML-310PT
 D 1816 (A,31,168) LED SML-310PT
 D 1817 (A,43,127) LED SML-310PT

R 202 (A,38,62) RS1/16SS473J
 R 203 (A,37,62) RS1/16SS473J
 R 214 (A,46,79) RS1/16SS472J
 R 216 (A,46,81) RS1/16SS472J
 R 221 (A,44,81) RS1/16SS103J

D 1818 (A,43,115) LED SML-310PT
 D 1819 (A,43,103) LED SML-310PT
 D 1820 (A,28,136) LED SML-310PT
 D 1821 (A,22,144) LED SML-310PT
 D 1823 (A,42,140) LED SML-310PT

R 222 (A,45,81) RS1/16SS103J
 R 225 (B,52,78) RS1/16SS103J
 R 226 (B,52,77) RS1/16SS393J
 R 227 (A,44,75) RS1/16SS562J
 R 228 (A,46,72) RS1/16SS122J

D 1824 (A,33,144) LED SML-310PT
 D 1825 (A,28,152) LED SML-310PT
 X 1801 (B,39,90) Ceramic Resonator 5.00MHz CSS1547
 LCD(DEH-2800MP/XN/UC) CAW1906
 LCD(DEH-2850MP/XN/ES) CAW1905

R 229 (A,44,72) RS1/16SS472J
 R 232 (A,46,75) RS1/16SS122J
 R 241 (B,26,63) RS1/16SS333J
 R 243 (B,26,62) RS1/16SS333J
 R 245 (B,26,69) RS1/16SS333J

RESISTORS

R 1801 (B,28,66) RS1/16S222J
 R 1802 (B,30,66) RS1/16S222J
 R 1807 (B,27,29) RS1/4SA471J
 R 1808 (B,31,42) RS1/4SA471J
 R 1809 (B,24,42) RS1/4SA681J

R 248 (B,55,74) RS1/16SS105J
 R 307 (A,19,20) RS1/16SS183J
 R 308 (A,17,20) RS1/16SS183J
 R 309 (A,18,18) RS1/16SS183J
 R 310 (A,17,16) RS1/16SS183J

R 1810 (B,42,98) RS1/16S104J
 R 1811 (B,21,29) RS1/4SA681J
 R 1812 (B,30,123) RS1/4SA471J
 R 1813 (B,35,128) RS1/4SA471J
 R 1814 (B,32,133) RS1/4SA681J

R 601 (B,30,47) RS1/16S101J
 R 602 (B,28,50) RS1/16S101J
 R 606 (B,20,54) RS1/16S0R0J
 R 701 (B,26,44) RS1/16SS221J
 R 707 (B,32,45) RS1/16SS473J

R 1815 (B,40,136) RS1/4SA471J

R 709 (A,36,35) RS1/16SS222J
 R 710 (B,41,46) RS1/16SS102J
 R 712 (A,45,57) RS1/16SS222J
 R 713 (B,40,57) RS1/16SS222J
 R 716 (B,29,37) RS1/16SS472J

CAPACITORS

C 1801 (B,42,102) CKSRYB103K50
 C 1802 (A,28,45) CKSRYF104Z25

R 724 (B,31,36) RS1/16S473J
 R 726 (B,23,47) RS1/16SS103J
 R 727 (B,31,42) RS1/16SS473J
 R 729 (B,20,48) RS1/16SS223J
 R 730 (B,20,46) RS1/16SS473J

C**Unit Number: CWX3176****Unit Name : CD Core****Unit(S10.5COMP1)****MISCELLANEOUS**

IC 201 (B,39,70) IC UPD63763CGJ
 IC 203 (A,12,16) IC NJM2886DL3-33
 IC 301 (A,28,18) IC BA5835FP
 IC 701 (A,32,48) IC PE5505A
 Q 101 (B,60,89) Transistor 2SA1577

R 740 (A,38,59) RS1/16SS222J
 R 746 (A,13,38) RS1/16SS104J
 R 750 (A,40,66) RS1/16SS473J
 R 902 (A,20,36) RS1/16SS221J
 R 905 (A,21,36) RS1/16SS221J

R 906 (B,20,36) RS1/16SS221J
 R 907 (B,16,62) RS1/16SS0R0J
 R 908 (B,16,64) RS1/16SS0R0J
 R 911 (B,20,32) RS1/16SS0R0J

CAPACITORS

Q 701 (B,24,41) Transistor UN2111
 X 201 (B,28,57) Ceramic Resonator 16.934MHz CSS1603
 X 701 (A,24,37) Ceramic Resonator 4.000MHz CSS1652
 S 901 (A,57,57) Switch(HOME) CSN1067
 S 903 (B,23,78) Switch(DSCSNS) CSN1067

C 103 (B,57,83) CEVW101M16
 C 108 (A,47,66) CKSSYB104K10
 C 201 (B,46,56) CKSSYB102K50
 C 202 (B,47,58) CKSSYB104K10

	5		6		7		8	
	<u>Circuit Symbol and No.</u>		<u>Part No.</u>					
	C 204	(B,35,48)	CEVW220M6R3					
	C 205	(A,34,63)	CKSSYB104K10					
	C 208	(B,34,54)	CKSSYB104K10					A
	C 209	(B,31,57)	CKSSYB104K10					
	C 210	(A,31,66)	CKSRYB105K10					
	C 216	(B,53,77)	CKSSYB332K50					
	C 217	(B,52,79)	CKSSYB104K10					
	C 218	(B,52,76)	CKSSYB473K10					
	C 219	(B,52,74)	CKSSYB104K10					
	C 220	(A,46,77)	CKSSYB182K50					
	C 221	(B,51,74)	CKSSYB104K10					
	C 222	(A,46,73)	CCSSCH560J50					
	C 223	(A,44,74)	CCSSCH4R0C50					
	C 224	(B,52,68)	CKSSYB104K10					B
	C 225	(A,47,67)	CKSSYB103K16					
	C 226	(A,49,67)	CCSSCH680J50					
	C 227	(A,48,65)	CCSSCH470J50					
	C 228	(A,46,62)	CKSSYB103K16					
	C 232	(A,12,31)	CKSRYB105K10					
	C 237	(A,31,67)	CKSSYB104K10					
	C 239	(A,46,74)	CCSSCH220J50					
	C 246	(A,42,80)	CKSSYB104K10					
	C 250	(A,42,81)	CKSRYB102K50					
	C 251	(A,41,83)	CKSRYB102K50					
	C 303	(A,18,20)	CKSSYB472K25					C
	C 304	(A,17,17)	CKSSYB103K16					
	C 307	(A,34,15)	CKSSYB104K10					
	C 308	(A,17,30)	CKSRYB105K10					
	C 601	(B,25,50)	CCSRCH102J50					
	C 602	(B,26,51)	CCSRCH102J50					
	C 701	(B,25,47)	CKSSYB104K10					
	C 703	(B,28,42)	CKSSYB103K16					
	C 706	(B,34,43)	CKSSYB104K10					
	C 707	(A,36,57)	CKSSYB104K10					
	C 714	(A,24,41)	CKSSYB104K10					
	C 722	(B,29,45)	CKSQYB475K6R3					D
	C 903	(B,14,54)	CKSSYB471K50					
	C 907	(B,14,62)	CKSSYB103K16					

Miscellaneous Parts List

	Pickup Unit(P10.5)(Service)	CXX1942
M 1	Motor Unit(SPINDLE)	CXC6742
M 2	Motor Unit(LOADING/CARRIAGE)	CXC4026

6. ADJUSTMENT

6.1 CD ADJUSTMENT

A

1) Cautions on adjustments

• In this product the single voltage (3.3V) is used for the regulator. The reference voltage is the REFO1 (1.65V) instead of the GND.

If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:

a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments.

B

Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.

b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.

c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

C

• For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

• The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

D

• The load and eject operation is not guaranteed with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.

• To enter the test mode.

While pressing the 4 and 6 keys at the same time, reset.

• To exit from the test mode.

Turn off the ACC and back up.

Notes:

a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.

b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.

c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.

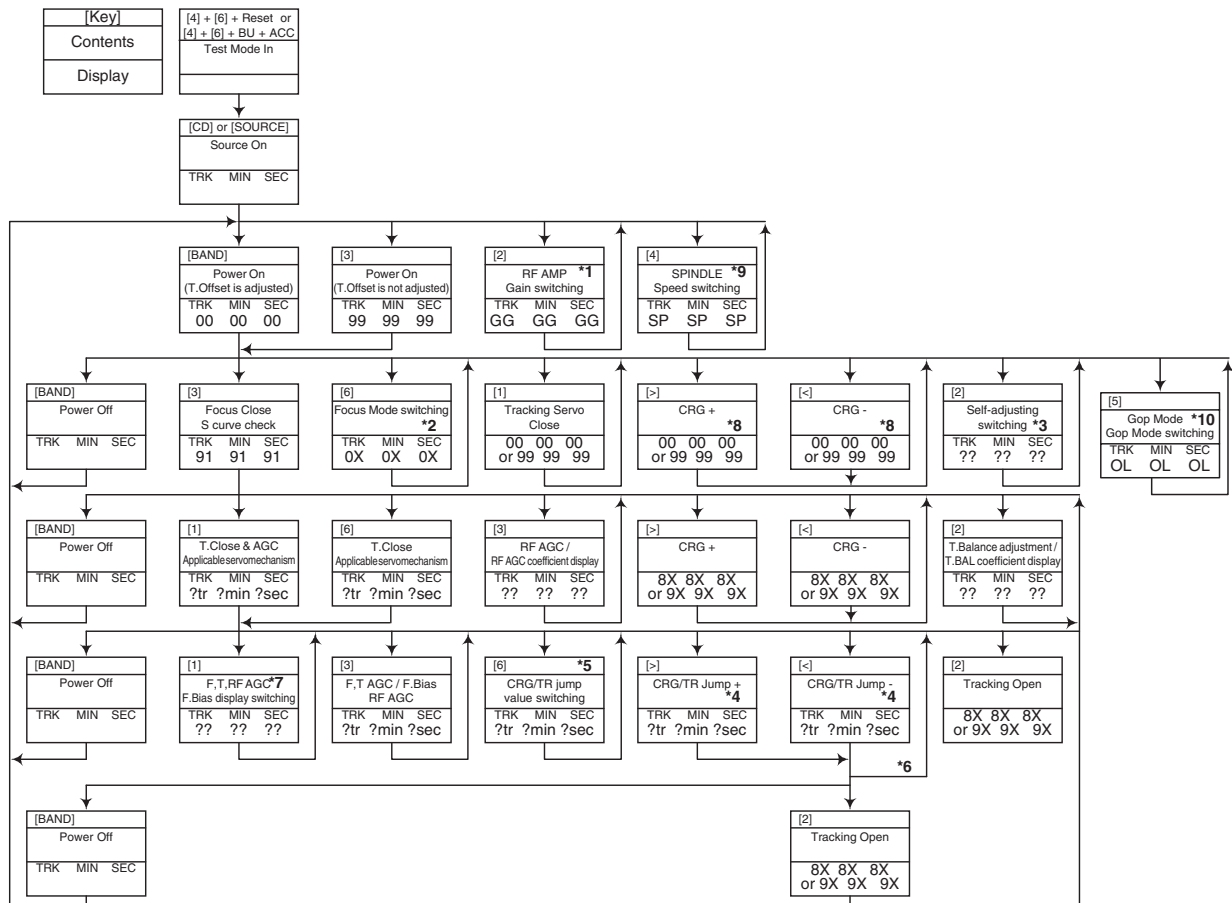
d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.

e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0dB, and the auto-adjustment values are reset to the default settings.

E

F

Flow Chart



*1) TRK MIN SEC → + 6 dB → + 12 dB
TRK₀₆ MIN₀₆ SEC₀₆ → TRK₁₂ MIN₁₂ SEC₁₂

*2) Focus Close → S Curve check setting → F EQ measurement setting
TRK₀₀ MIN₀₀ SEC₀₀ → TRK₀₁ MIN₀₁ SEC₀₁ → TRK₀₂ MIN₀₂ SEC₀₂
(TRK₉₉ MIN₉₉ SEC₉₉)

*3) F.Offset Display → RF.Offset → T.Offset Display → Switch to the order of the original display

*4) 1TR/4TR/10TR/32TR/100TR

*5) Single → 4TR → 10TR → 32TR → 100TR → CRG Move
9x(8x):91(81) 92(82) 93(83) 94(84) 95(85) 96(86)

*6) Only at the time of CRG move, 100TR jump

*7) TRK/MIN/SEC → F.AGC → T.AGC Gain → F.Bias → RF AGC

*8) CRG motor voltage = 2 [V]

*9) TYP (1X) → 2X → 1X
TRK MIN SEC → TRK₂₂ MIN₂₂ SEC₂₂ → TRK₁₁ MIN₁₁ SEC₁₁

*10) OFF(TYP) → FORCUS → TRACKING
TRK MIN SEC → TRK₇₀ MIN₇₀ SEC₇₀ → TRK₇₁ MIN₇₁ SEC₇₁

• As for the double speed (2x), audio output cannot be supported

- *1) • After the [Eject] key is pressed keys other than the [Eject] key should not be pressed, until disc ejection is complete.
- When the key [2] or [3] is pressed during the Focus Search, the power supply should be immediately turned off (otherwise the lens sticks to Wall, causing the actuator to be damaged).
- In the case of TR jump other than to 100TR, the function shall continue to be processed even if the TR jump key is released. As for the CRG Move and 100TR Jump, the mechanism shall be set to the Tracking Close mode when the key is released.
- When the power is turned on/off the jump mode is reset to the Single TR (91) while the gain of the RFAMP is reset to 0 dB. At the same time all the self-adjusting values shall return to the default setting.

6.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT



• Note :

The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

• Purpose :

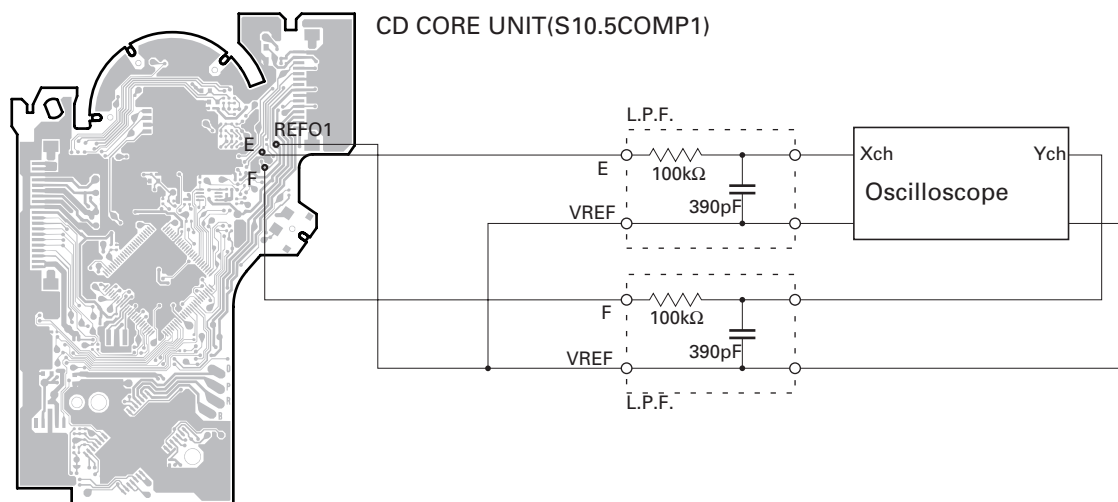
To check that the grating is within an acceptable range when the PU unit is changed.

• Symptoms of Mal-adjustment :

If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

• Method :

- | | |
|-----------------------|----------------------------|
| • Measuring Equipment | • Oscilloscope, Two L.P.F. |
| • Measuring Points | • E, F, REFO1 |
| • Disc | • TCD-782 |
| • Mode | • TEST MODE |



• Checking Procedure

1. In test mode, load the disc and switch the 3V regulator on.
2. Using the → and ← buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

• Note

Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• Hint

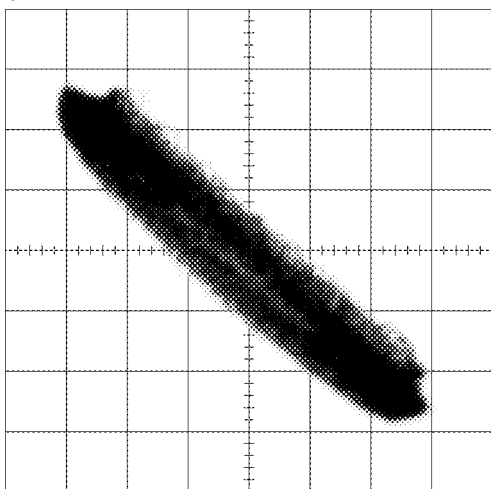
Reloading the disc changes the clamp position and may decrease the "wobble".

Grating waveform

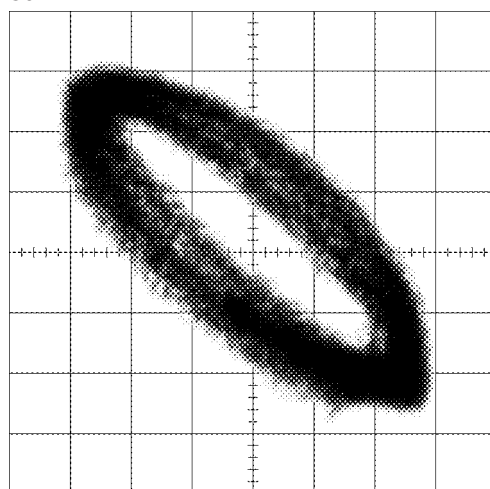
Ech → Xch 20mV/div, AC

Fch → Ych 20mV/div, AC

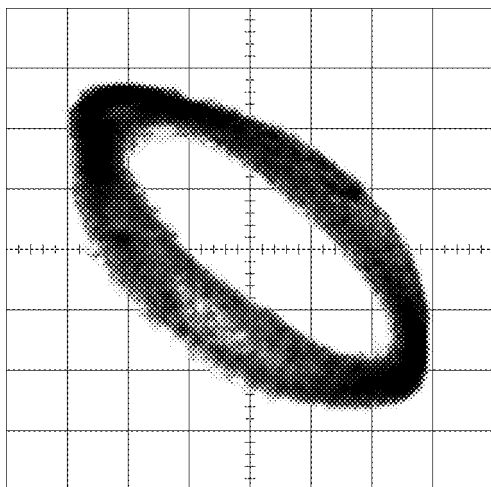
0°



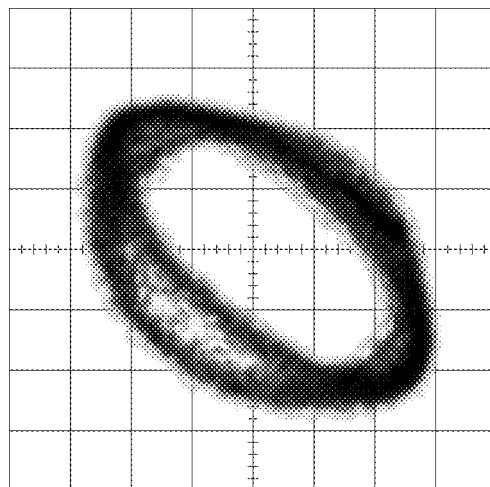
30°



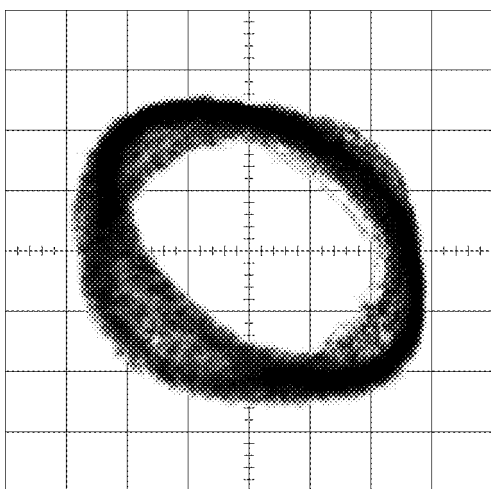
45°



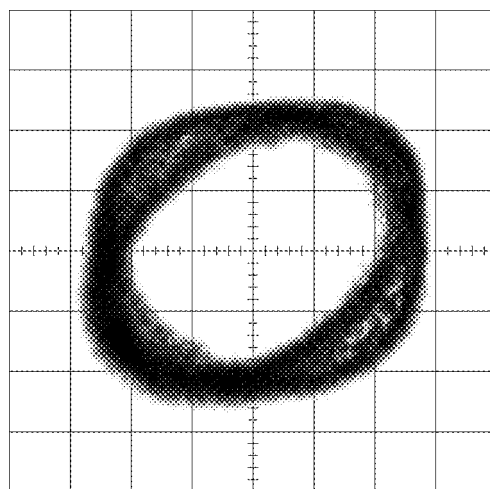
60°



75°



90°



Error Messages

A If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

B 2) Head unit display examples
Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

8-digit display	6-digit display	4-digit display
ERROR-xx	ERR-xx	E-xx

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG SERVO LSI Com- munication Error	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. → Failure on home switch or CRG move mechanism. Communication error between microcomputer and SERVO LSI.
11	Electricity	Focus Servo NG	Focusing not available. → Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. CD signal error.
17	Electricity	Setup NG	AGC protection doesn't work. Focus can be easily lost. → Damages or stains on disc, or excessive vibrations on REWRITABLE.
30	Electricity	Search Time Out	Failed to reach target address. → CRG tracking error or damages on disc.
44	Electricity	ALL Skip	Skip setting for all track. (CD-R/RW)
50	Mechanism	CD On Mech Error	Mechanical error during CD ON. → Defective loading motor, mechanical lock and mechanical sensor.
A0	System	Power Supply NG	Power (VD) is ground faulted. → Failure on SW transistor or power supply (failure on connector).

E Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).
Unreadable TOC does not constitute an error. An intended operation continues in this case.
Upper digits of an error code are subdivided as shown below:
1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

6.4 SYSTEM MICROCOMPUTER TEST PROGRAM



● PCL Output

In the normal operation mode (with the detachable panel installed, the ACC switched ON, the standby mode cancelled), shift the TESTIN IC601(Pin 15) terminal to H. The clock signal is output from the PCL terminal IC601(Pin 14). The frequency of the clock signal is 786.432 kHz that is one 16th of the fundamental frequency. The clock signal should be $786.432 \text{ kHz} \pm 31.5 \text{ Hz}$. If the clock signal is out of the range, the X'tal (X601) should be replaced with new one.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

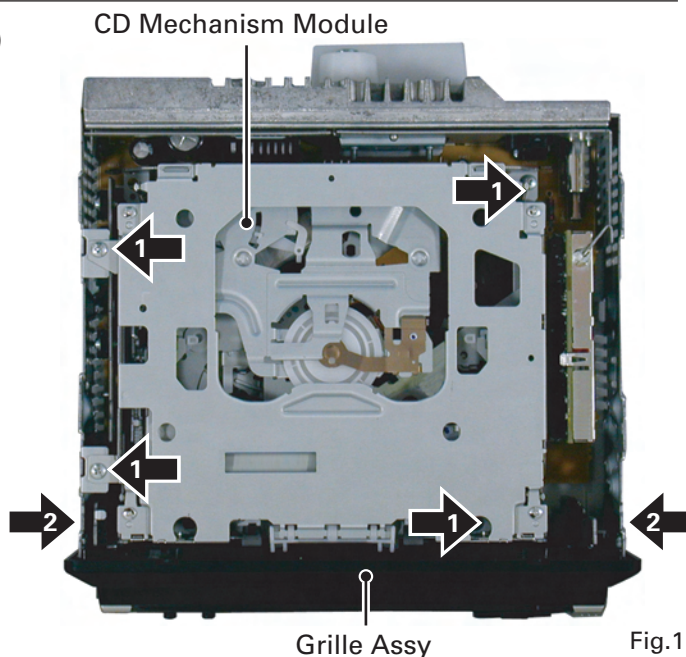
● Removing the Case (not shown)

1. Remove the Case.

● Removing the CD Mechanism Module (Fig.1)

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.



● Removing the Grille Assy (Fig.1)

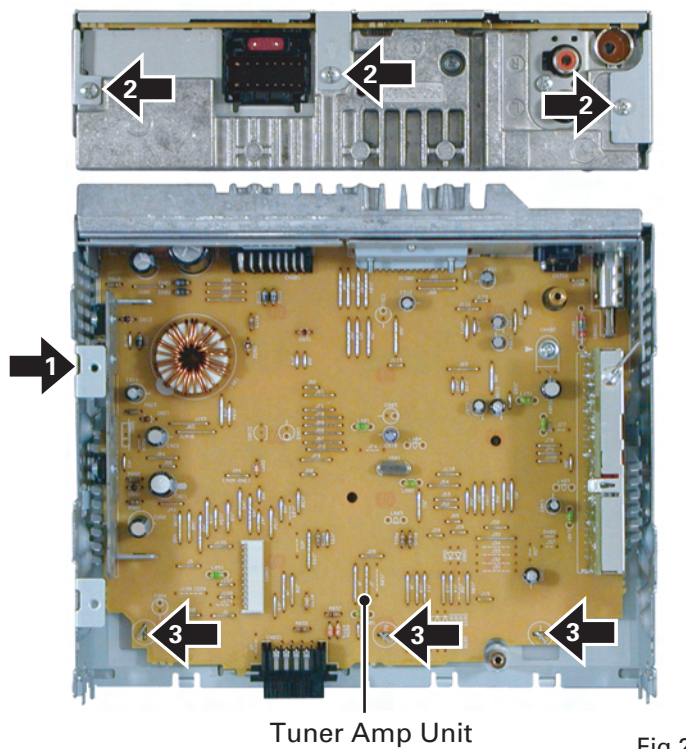
2 Release the two latches and then remove the Grille Assy.

● Removing the Tuner Amp Unit (Fig.2)

1 Remove the screw.

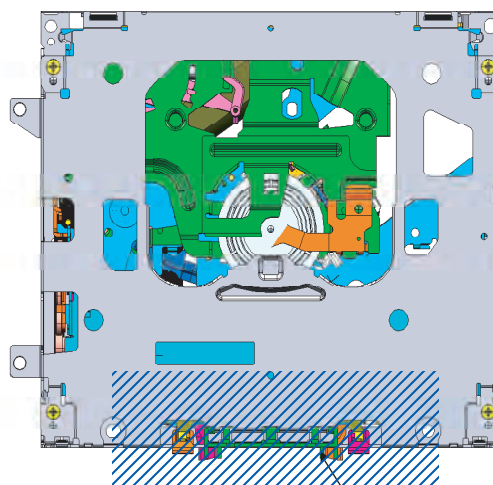
2 Remove the three screws.

3 Straighten the tabs at three locations indicated and then remove the Tuner Amp Unit.



● How to hold the Mechanism Unit

1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.

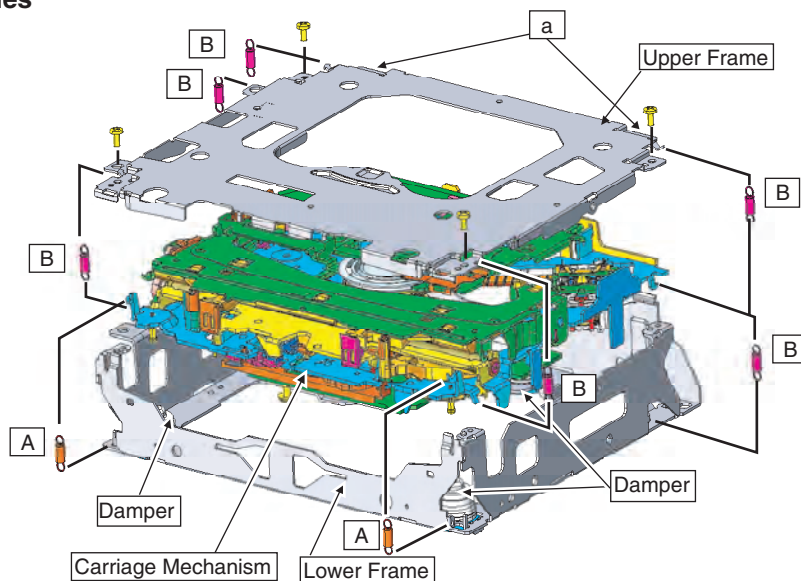


Do not squeeze this area.

● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

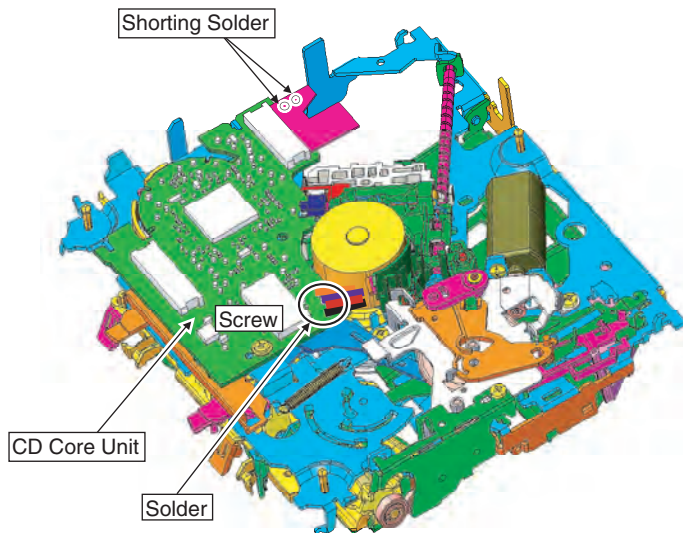
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.



● How to remove the CD Core Unit

1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.

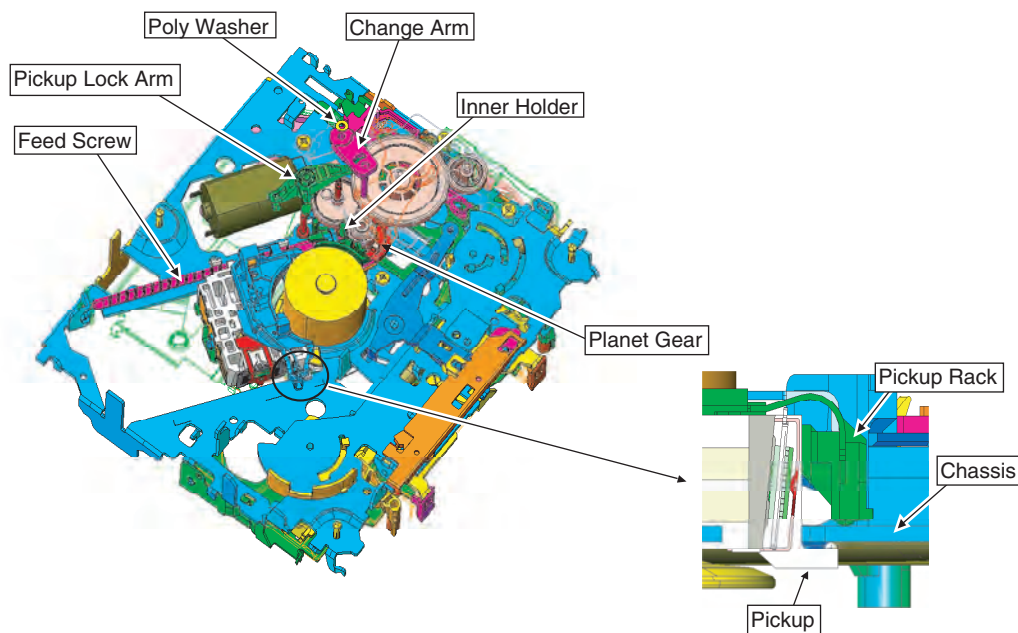


● How to remove the Pickup Unit

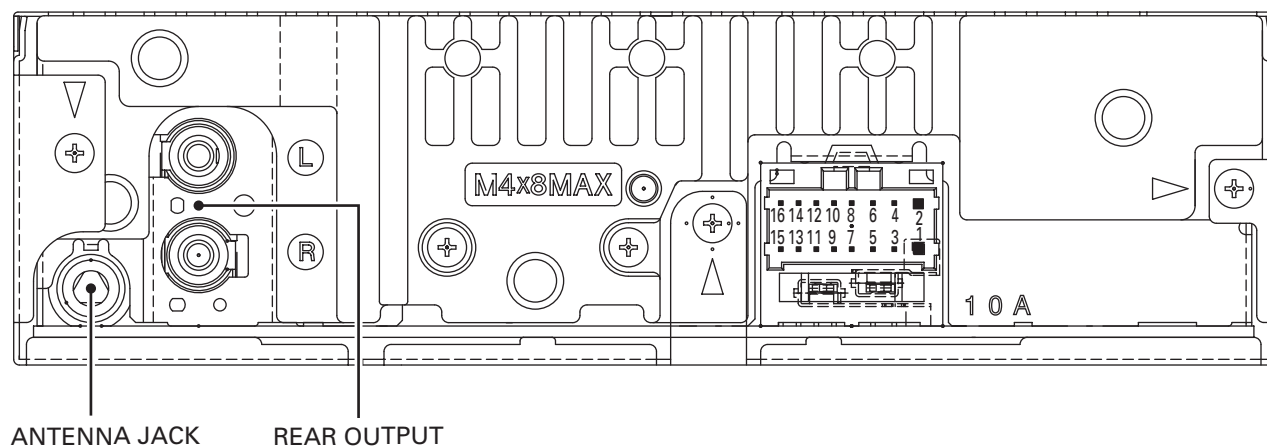
1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.

Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



7.1.2 CONNECTOR FUNCTION DESCRIPTION



Pin No.		Pin No.	
1	B.UP	9	RL-
2	GND	10	FL-
3	ACC	11	RL+
4	NC	12	FL+
5	NC	13	RR-
6	B.REMOTE	14	FR-
7	NC	15	RR+
8	NC	16	FR+

7.2 PARTS

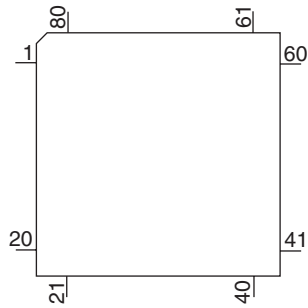
7.2.1 IC

● Pin Functions (PE5518A)

Pin No.	Pin Name	I/O	Function and Operation
1	MODEL1	I	Model select input
2,3	NC		Not used
4	AVSS		GND
5,6	NC		Not used
7	AREF1		VDD
8	KYDT	I	Display microcomputer data input
9	DPDT	O	Display microcomputer communication data output
10	NC		Not used
11	TUNPDI	I	PLL data input
12	TUNPDO	O	PLL data output
13	TUNPCK	O	PLL clock output
14	PCL	O	Clock adjustment output
15	TESTIN	I	Test program input
16	BSI	I	Bus serial data input
17	BDATA	O	Bus serial output data
18	BSCK	O	Bus serial clock output
19	DORAON		Not used
20	NC		Not used
21	SWVDD	O	Display microcomputer chip select output
22	ILMPW	O	Illumination power output
23-31	NC		Not used
32	DALMON	O	Output for dark current reduction circuit / Stand-by mode : L output
33	VSS		GND
34	BRST	O	Bus reset output
35	BRXEN	I/O	Bus RX enable input/output
36	CDRESET	O	CD microcomputer reset signal output
37	ROMDATA	O	ROM collection data output
38	ROMCLK	O	ROM collection clock output
39	ROMCS	O	ROM collection chip select output
40	RECEIVE	O	RDS decoder receiving output
41,42	NC		Not used
43	SYSPW	O	System power output
44-46	NC		Not used
47	STRKEY2	I	Wired remote control input 2
48	MUTE	O	System mute output
49	ANTPW	O	Auto antenna control output
50	NC		Not used
51	VST	O	E.VOL strobe output
52	VDT	O	E.VOL data output
53	VCK	O	E.VOL clock output
54	NC		Not used
55	TUNPCE2	O	PLL chip enable output 2
56	TUNPCE	O	PLL chip enable output
57	RDT	I	RDS LK input
58	RDSLK	I	RDS clock input
59	RDS57K	I	RDS 57K input
60	RESET		Reset
61	LDET	I	PLL lock detection input
62	RCK	I	RDS clock input
63	ASENS	I	ACC sense input
64	BSENS	I	Back up sense input
65	DSENS	I	Grille detach sense input
66	SOURCE	I	Source sense input
67	VSS		GND
68	VDD		VDD

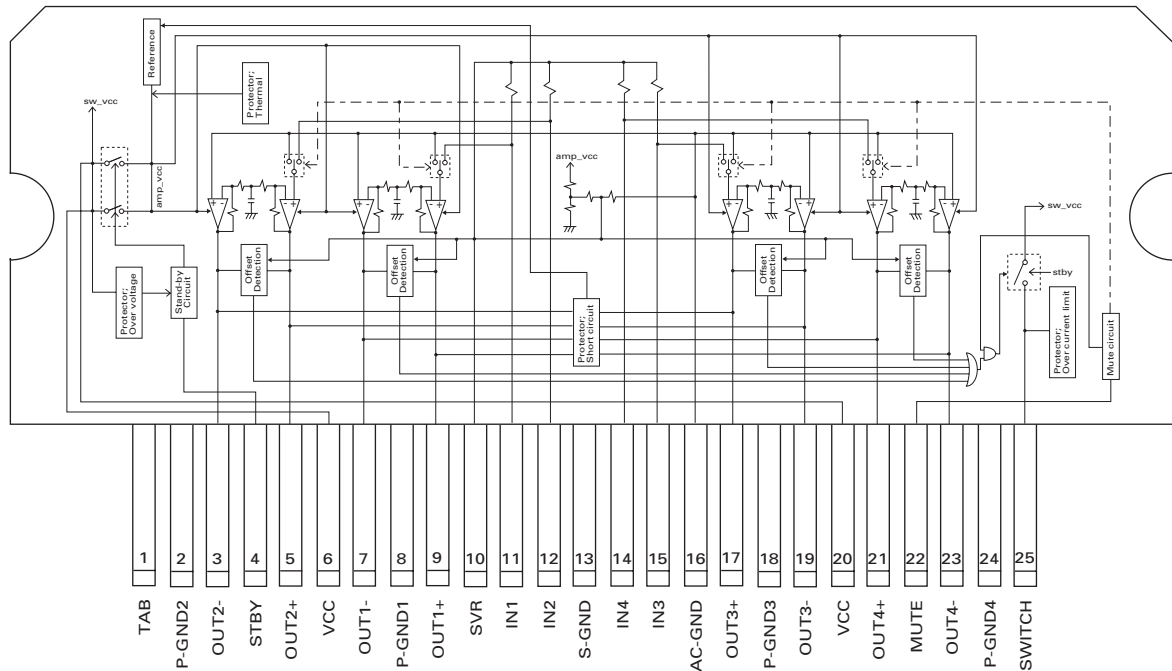
Pin No.	Pin Name	I/O	Function and Operation
69,70	X2,1		Crystal oscillator connection pin
71	IC(VPP)		GND
72	NC		Not used
73	VSS		VSS
74	AVDD		VDD
75	AVREF1		VDD
76	SL	I	Signal level input
77,78	NC		Not used
79	BSRQ	I	Bus slave service request
80	STRKEY1	I	Wired remote control input 1

*PE5518A



IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

PAL007B



PML014A

● Block Diagram

● Pin Layout

A

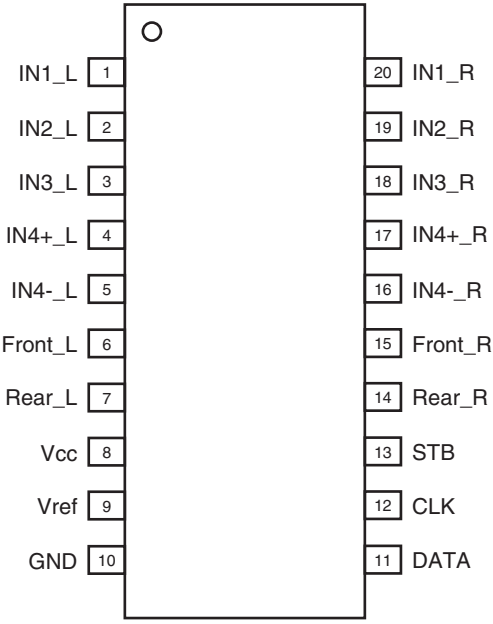
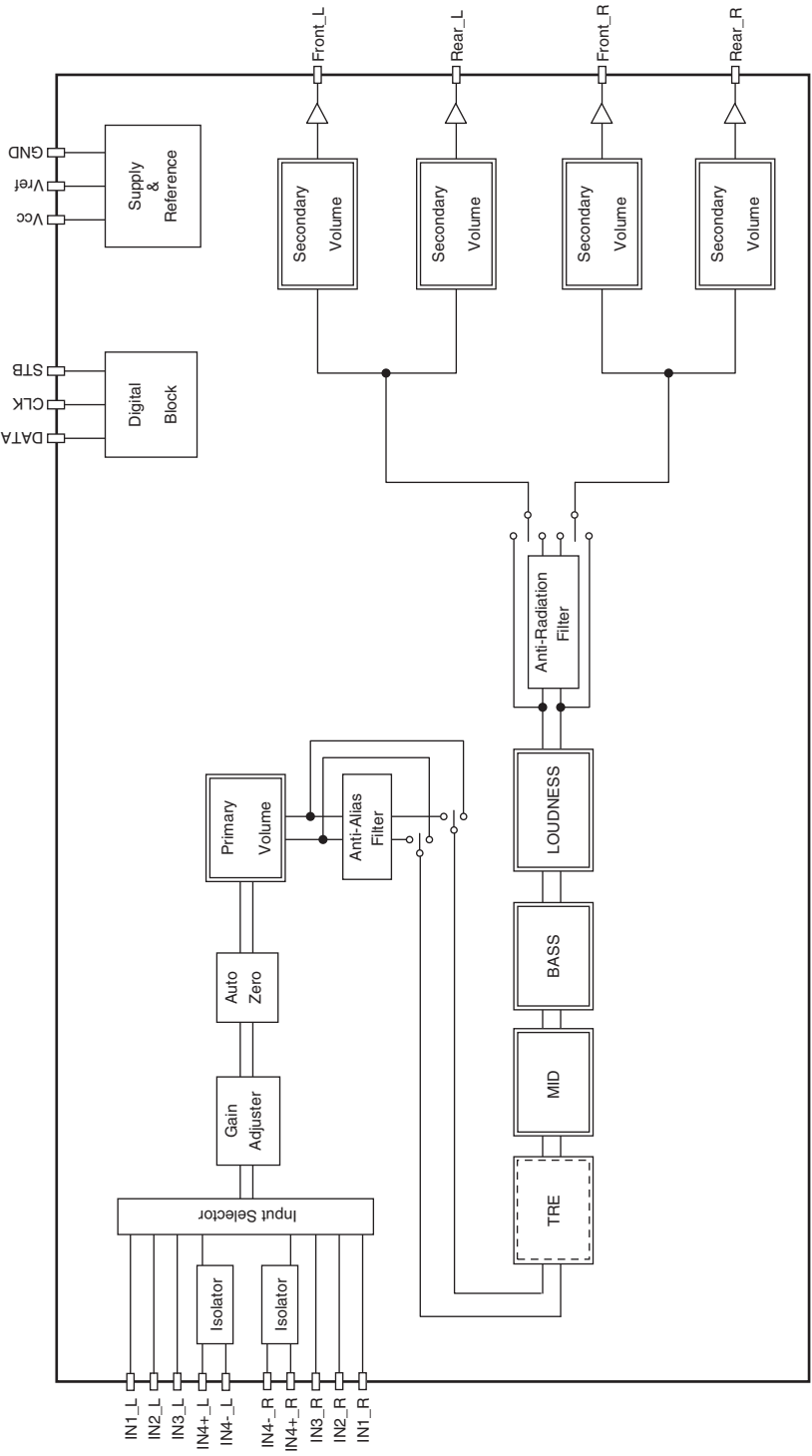
B

C

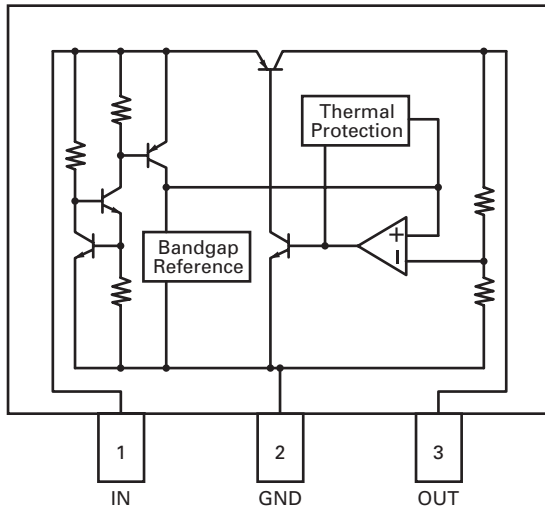
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E

F



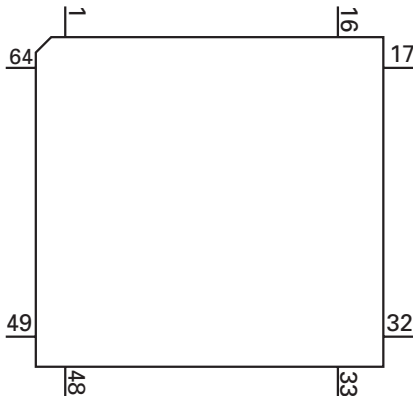
NJM2885DL1-33



● Pin Functions(PD6340A)

Pin No.	Pin Name	I/O	Function and Operation
1-5	SEG4-0	O	LCD segment output
6-9	COM3-0	O	LCD common output
10	VLCD		LCD drive power supply
11-14	KST3-0	O	Key strobe output
15,16	KDT0,1	I	Key data input (analogue input)
17	REW	I	Remote control reception input
18	DPDT	I	Display data input
19	NC		Not used
20	KYDT	O	Key data output
21	MODA		GND
22	X0		Crystal oscillator connection pin
23	X1		Crystal oscillator connection pin
24	VSS		GND
25,26	KDT2,3	I	Key data input
27	NC		Not used
28	KST4	O	Key strobe output
29-32	NC		Not used
33-55	SEG35-13	O	LCD segment output
56	VDD		Power supply
57-64	SEG12-5	O	LCD segment output

* PD6340A

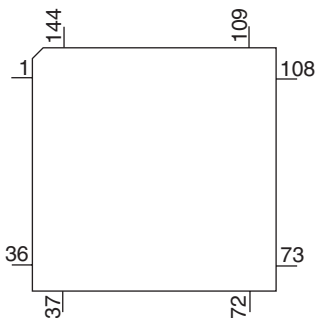


Pin Functions (UPD63763CGJ)

Pin No.	Pin Name	I/O	Function and Operation
1	D.VDD		Power supply for digital circuits
2	D1.GND		Ground for 1.6 V digital circuits
3	RESET	I	Input of reset
4-8	AB12-8	I	Address bus 12-8 from the microcomputer
9-16	AD7-0	I/O	Address/data bus 7-0 to the microcomputer
17	\overline{CS}	I	Chip selection
18	ASTB	I	Address strobe
19	READ	I	Control signals(read)
20	WRITE	I	Control signals(write)
21	WAIT	O	Control signals(wait)
22	INTQ	O	Interruption signals to the external microcomputer
23,24	IFMODE0,1	I	Switching the microcomputer I/F 0, 1
25	D1.VDD		Power supply for 1.6 V digital circuits
26	DA.VDD		Power supply for DAC
27	ROUT	O	Output of audio for the right channel
28	DA.GND		Ground for DAC
29	REGC		Connected to the capacitor for band gap
30	DA.GND		Ground for DAC
31	LOUT	O	Output of audio for the left channel
32	DA.VDD		Power supply for DAC
33	X.VDD		Power supply for the crystal oscillator
34	XTAL	I	Connected to the crystal oscillator(16.9344 MHz)
35	XTAL	O	Connected to the crystal oscillator(16.9344 MHz)
36	X.GND		Ground for the crystal oscillator
37	VDDREG15		Control of 1.6 V regulator
38	PWMSW0	I	Setup 0 for PWM output(SD, MD)
39-41	TEST3-1	I	Connected to Ground
42	PWMSW1	I	Setup 1 for PWM output(FD, TD)
43	TESTEN	I	Connected to Ground
44	D1.GND		Ground for 1.6 V digital circuits
45	DIN	I	Input of audio data
46	DOUT	O	Output of audio data
47	SCKIN	I	Clock input for audio data
48	SCKO	O	Clock output for audio data
49	LRCKIN	I	Input of LRCK for audio data
50	LRCK	O	Output LRCK for audio data
51	\overline{XTALEN}	I	Permission to oscillate 16.9344 MHz
52	D1.VDD		Power supply for 1.6 V digital circuits
53	RFCK/HOLD	O	Output of RFCK/HOLD signal
54	WFCK/MIRR	O	Output of WFCK/MIRR signal
55	PLCK/RFOK	O	Output of PLCK/Output of RFOK
56	LOCK/RFOK	O	Output of LRCK/Output of RFOK
57	C1D1/C8M/(RA13)	O	Information on error correction/C8M : 8 MHz
58	C1D2/C16M/(RA12)	O	Information on error correction/C16M : 16 MHz
59	C2D1/RMUTE	O	Information on error correction/Mute for Rch
60	C2D2/LMUTE	O	Information on error correction/Mute for Lch
61	C2D3/SHOCK	O	Information on error correction/Detection of vibration
62	D1.GND		Ground for 1.6 V digital circuits
63	C33M	O	Output of 33.8688 MHz(CLK for SDRAM)
64	(RCS)	O	DRAM \overline{CS}
65	RA11	O	Output of DRAM address 11
66	(CKE)	O	Output of DRAM CKE
67	RAS	O	Output of DRAM RAS
68	$\overline{CAS0}$ (LDQM)	O	Output of DRAM lower \overline{CAS} (LDQM)
69	$\overline{CAS1}$ (UDQM)	O	Output of DRAM upper \overline{CAS} (UDQM)

Pin No.	Pin Name	I/O	Function and Operation
70	WE	O	Output of DRAM WE
71	OE(CAS)	O	Output of DRAM OE(CAS)
72	D.GND		Ground for digital circuits
73-88	RDB0-15	I/O	Input/output of DRAM data0-15
89-99	RA0-10	O	Output of DRAM address0-10
100	D.VDD		Power supply for digital circuits
101	FD+	O	Output of focus drive PWM +
102	FD-	O	Output of focus drive PWM -
103	TD+	O	Output of tracking drive PWM +
104	TD-	O	Output of tracking drive PWM -
105	SD+	O	Output of thread drive PWM +
106	SD-	O	Output of thread drive PWM -
107	MD+	O	Output of spindle drive PWM +
108	MD-	O	Output of spindle drive PWM -
109	REFOUTSV	O	REFOUT for servo
110	AD.VDD		Power supply for ADC
111	EFM	O	Output of EFM signals
112	ASY	I	Input of asymmetry
113	ATEST	O	Analog tests
114	RFI	I	Input of RF
115	AD.GND		Ground for the analog system
116	AGCO	O	Output of RF
117	C3T	O	Connection to the capacitor for detecting 3T
118	AGCI	I	Input of AGC
119	RFO	O	Output of RF(AGC)
120,121	EQ2,1	I	Equalizer 2, 1
122	RF2-	I	Reversal input of RF2
123	RF-	I	Reversal input of RF
124	A.GND		Ground for the analog system
125	A	I	Input of A
126	C	I	Input of C
127	B	I	Input of B
128	D	I	Input of D
129	F	I	Input of F
130	E	I	Input of E
131	VREFIN	I	Input of reference voltage
132	A.VDD		Power supply for the analog system
133	REFOUT	O	Output of reference voltage
134	REFC	I	Connected to the capacitor for output of REFOUT
135	FE-	I	Reversal input of FE
136	FEO	O	Output of FE
137	ADIN	I	Input of FE, TE A/D converter
138	TE-	I	Reversal input of TE
139	TEO	O	Output of TE
140	TE2	O	TE2
141	TEC	I	TEC
142	LD	O	Output of LD
143	PD	I	Input of PD
144	D.GND		Ground for digital circuits

* UPD63763CGJ

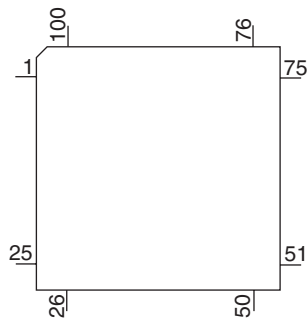


Pin Functions (PE5505A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	AVREF			A power supply / Positive power supply(5V)
2	AVSS			A power supply GND
3	TESTIN	I		Chip check test program starting input
4	CLAMP			Not used
5	EVDD			E power supply / Positive power supply
6	FMODE			For flash rewriting / L : flash rewriting mode
7	FLRQ			For flash rewriting / Reset voltage control
8	IC/FLMOD0			IC : VSS direct connection/FLMOD0 : Pull-down
9	VDD			Positive power supply(5V)
10	REGC			Connected to the capacity stabilizing output of the regulator
11	VSS			GND
12	X1	I		Oscillator connection for mainclock
13	X2			Oscillator connection for mainclock
14	RESET	I		System reset input
15	XT1	I		Connected to the oscillator for subclock(connected to VSS via the resistor)
16	XT2			Connected to the oscillator for subclock(Open)
17	PULLDOWN	I		Connected to EVDD or EVSS via the resistor
18	EJSW			Not used
19	XINT	I	C	CD LSI interruption signal input
20	NC			Not used
21	BRST	I		Bus reset input
22	BSI	I		Bus serial data input
23	BSO	O	C	Bus serial data output
24	BSCK	I/O	/C	Bus serial clock input/output
25	FTxD	O	C	For flash rewriting(transmitted signal)
26	FRxD	I		For flash rewriting(received signal)
27	BRXEN	I/O	/C	Bus RX enable input/output
28	BSRQ	I/O	/C	Bus serial clock input/output
29	DSPOK			Not used
30	DSCSNS	I	C	Disc state sense input
31	8EJ(S905)	I	C	input of detection of 8 cm disc ejection
32	12EJ(S904)	I	C	input of detection of 12 cm disc ejection
33	EVSS			E power supply GND
34	EVDD			E power supply / Positive power supply
35,36	SRAMLEVEL0,1	O		SRAM level meter output
37	EMPH	O	C	Emphasis information output
38	EMPH			Not used
39	CDMUTE			Not used
40	LOEJ			Not used
41	CLCONT	O		Driver input switching output
42	HOME	I		Home SW sense input
43	ADENA	O	C	A/D reference voltage supply control output
44	LRCKOK	O	C	(DOUT mute output)
45	SRAMLEVEL2	O	C	SRAM level meter output
46	CD3VON(MCKRQ)	O	C	CD + 3.3 V power supply control output(Digital output : MCKRQ)
47	CONT	O	C	Servo driver power supply control output
48	XRST	O	C	CD LSI reset control output
49	VDCONT	O	C	VD power supply control output
50	XSI	I		CD LSI serial data input
51	XSO	O	C	CD LSI serial data output
52	XCK	O	C	CD LSI serial clock output
53	XWAIT	I	C	CD LSI wait control signal input
54	XASTB	O	C	CD LSI address strobe output
55	AD0	O	C	Address/data Bus 0
56	INT			Not used

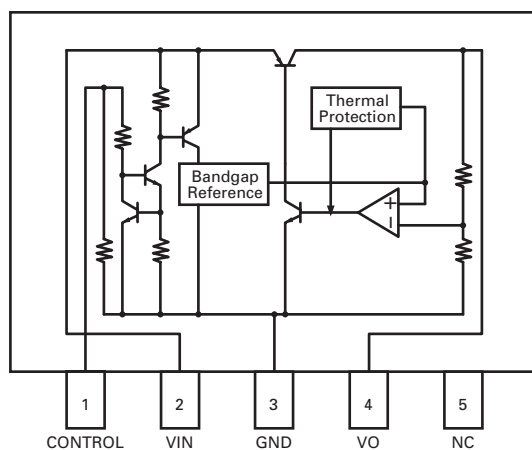
Pin No.	Pin Name	I/O	Format	Function and Operation
57	ROMDATA	I/O		E2PROM data input/output
58	ROMCK	O		E2PROM clock output
59	ROMCS	O	C	E2PROM chip selection output
60,61	NC			Not used
62	CLKOUT			Not used
63	LOCK	I		Spindle lock input
64-68	NC			Not used
69	BVSS			B power supply GND
70	BVDD			B power supply / Positive power supply
71-75	NC			Not used
76	FLMD1	I/O	/C	Address/Data Bus 5
77-90	NC			Not used
91-93	A/D			Not used
94	CSENS			Not used
95	TYPE_A/D			Not used
96,97	NC			Not used
98	TEMP			Not used
99	VDSNS	I		VD power supply short sense input
100	DSCSNS			Not used

* PE5505A

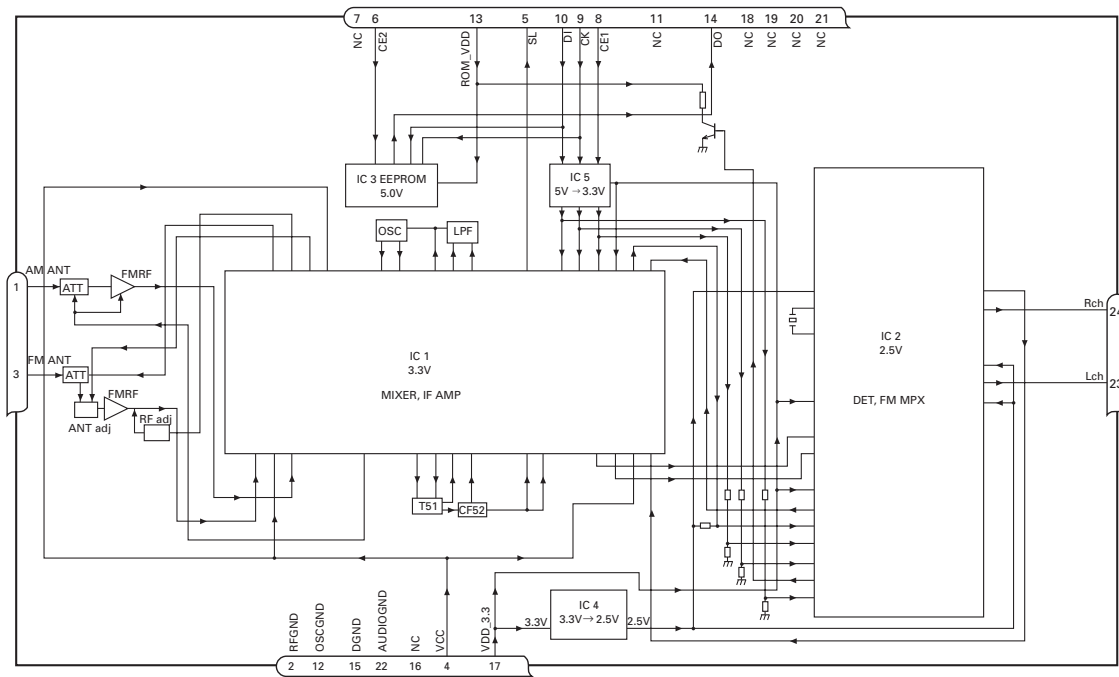


Format	meaning
C	C MOS

NJM2886DL3-33



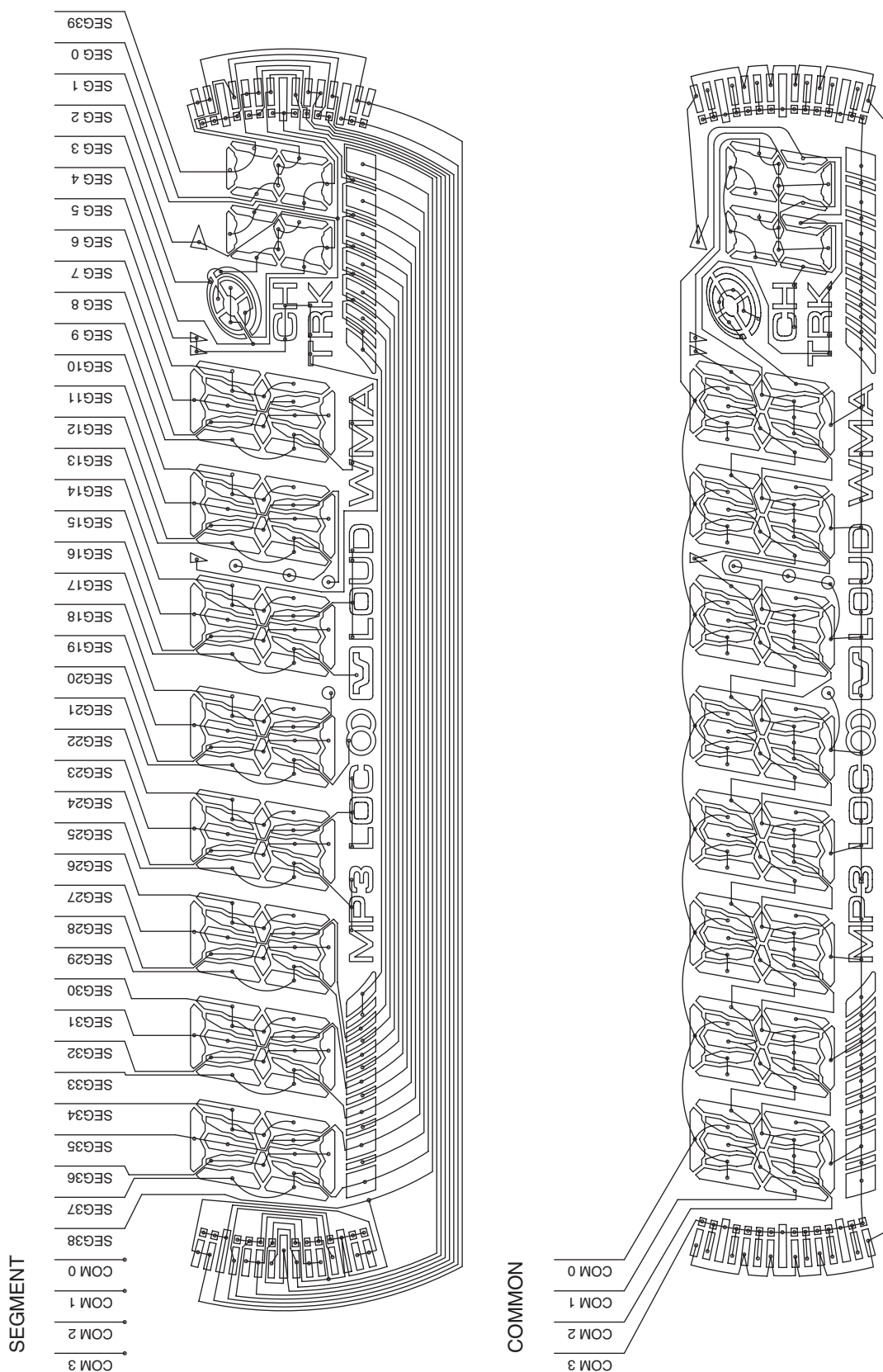
FM/AM Tuner Unit



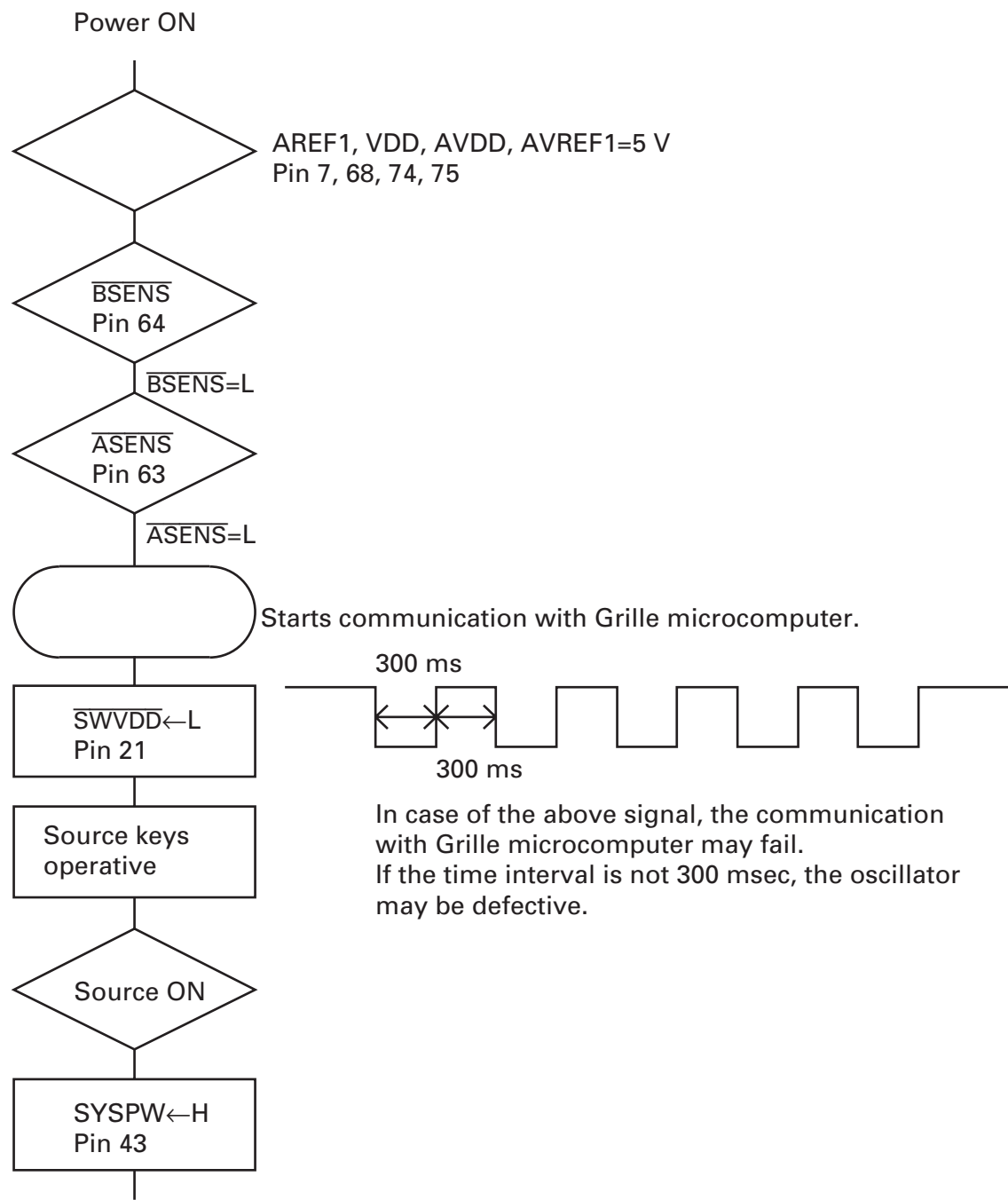
No.	Symbol	I/O	Explain
1	AMANT	I	AM antenna input AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7μH. (LAU type inductor) A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the hum of power transmission line.
2	RFGND		RF ground Ground of antenna block
3	FMANT	I	FM antenna input Input of FM antenna 75Ω Surge absorber(DSP-201M-S00B) is necessary.
4	VCC		power supply The power supply for analog block. D.C 8.4V ± 0.3V
5	SL	O	signal level Output of FM/AM signals level
6	CE2	I	chip enable-2 Chip enable for EEPROM "Low" active
7	NC		non connection Not used
8	CE1	I	chip enable-1 Chip enable for AF•RF "High" active
9	CK	I	clock Clock
10	DI	I	data in Data input
11	NC		non connection Not used
12	OSCGND		osc ground Ground of oscillator block
13	ROM_VDD		power supply Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out Data output
15	DGND		digital ground Ground of digital block
16	NC		non connection Not used
17	VDD_3.3		power supply The power supply for digital block. 3.3V ± 0.2V
18	NC		non connection Not used
19	NC		non connection Not used
20	NC		non connection Not used
21	NC		non connection Not used
22	AUDIOGND		audio ground Ground of audio block
23	L ch	O	L channel output FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output FM stereo "R-ch" signal output or AM audio output

7.2.2 DISPLAY

- LCD(CAW1906)(DEH-2800MP/XN/UC)
- LCD(CAW1905)(DEH-2850MP/XN/ES)

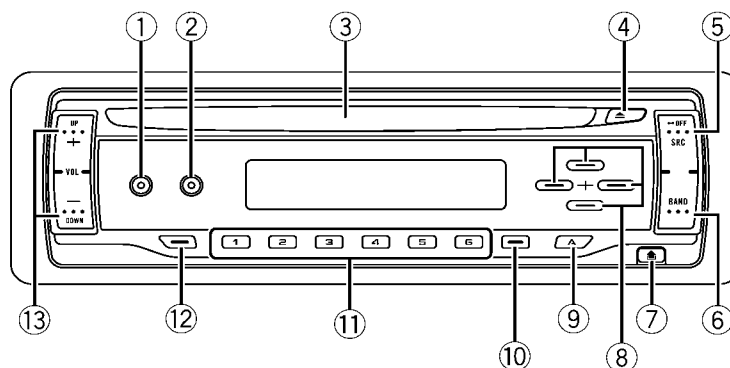


7.3 OPERATIONAL FLOW CHART



Completes power-on operation.(After that, proceed to each source operation.)

8. OPERATIONS



Head unit

① **EQ button**

Press to select various equalizer curves.
Press and hold to turn loudness on or off.

② **DISPLAY button**

Press to select different displays.

③ **Disc loading slot**

Insert a disc to play.

④ **EJECT button**

Press to eject a CD from your built-in CD player.

⑤ **SOURCE button**

This unit is turned on by selecting a source.
Press to cycle through all the available sources.

⑥ **BAND button**

Press to select among three FM bands and one AM band and to cancel the control mode of functions.

⑦ **DETACH button**

Press to remove the front panel from the head unit.

⑧ **▲/▼/◀/▶ buttons**

Press to perform manual seek tuning, fast forward, reverse and track search controls. Also used for controlling functions.

⑨ **AUDIO button**

Press to select various sound quality controls.

⑩ **LOCAL/BSM button**

Press to turn local function on or off.
Press and hold to turn BSM function on or off.

⑪ **1-6 buttons**

Press for preset tuning. Also used for controlling functions.

⑫ **CLOCK button**

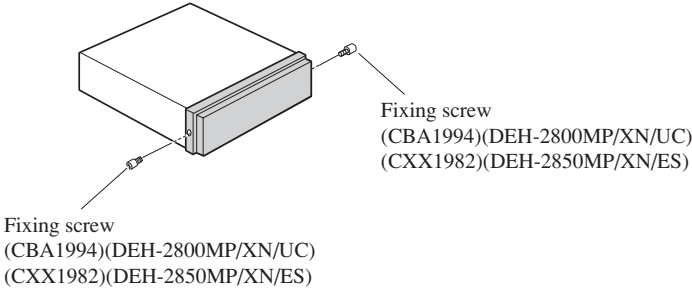
Press to change to the clock display.

⑬ **VOLUME (+/-) buttons**

Press to increase or decrease the volume.

About the fixing screws for the front panel

A If you do not operate the Detaching and Replacing the Front Panel Function, use the supplied fixing screws and fix the front panel to this unit.



B

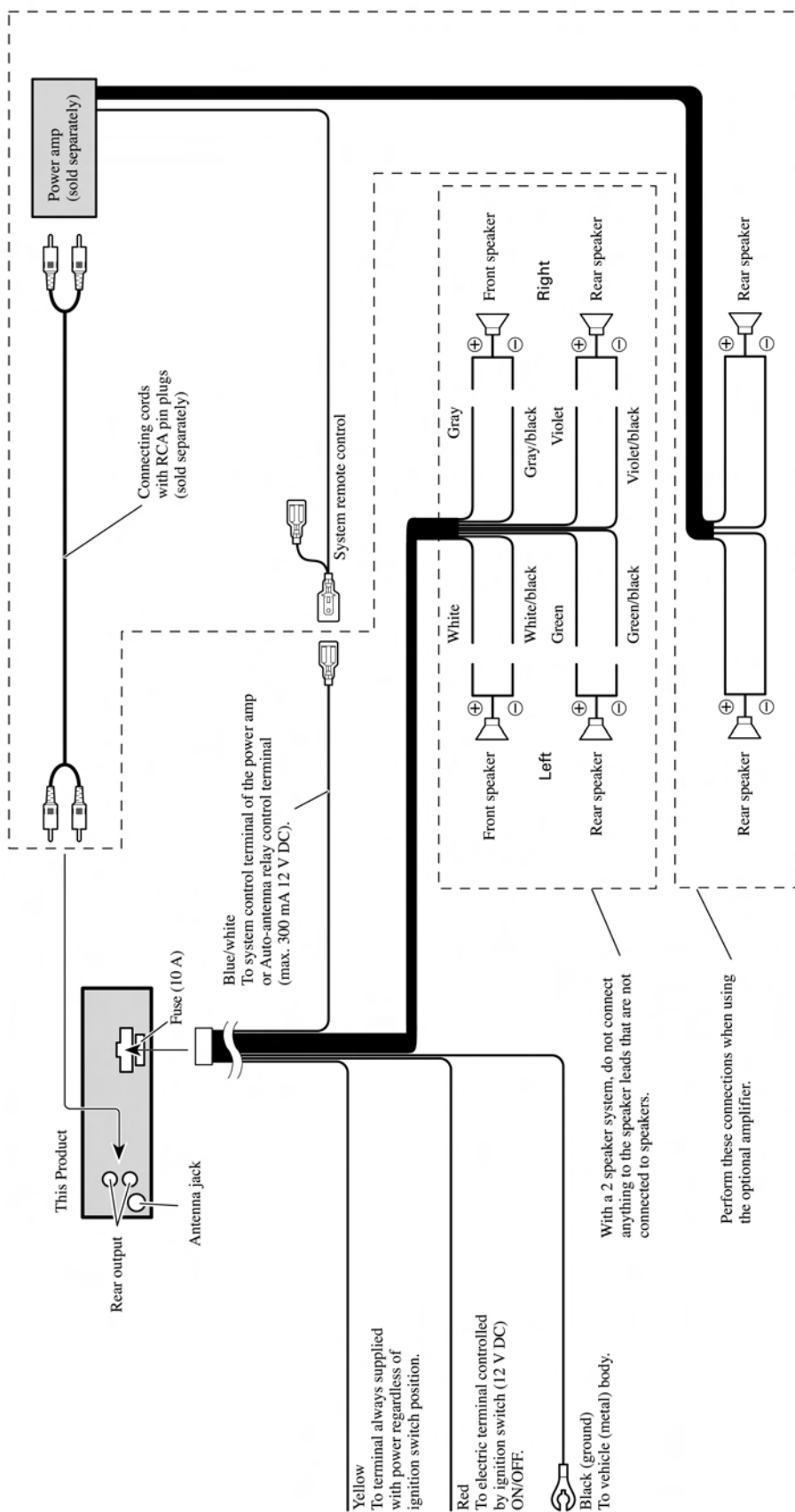
C

D

E

F

● CONNECTION DIAGRAM



● Jigs List

A

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

● Grease List

B

Name	Grease No.	Remarks
Grease	GEM1024	CD Mechanism Module
Grease	GEM1045	CD Mechanism Module



Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

C

Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

D

E

F

Service Manual

ORDER NO.
CRT3583

CD MECHANISM MODULE(S10.5COMP1)

CX-3164

This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.

When performing repairs use this manual together with the specific manual for model under repair.

Model	Service Manual	CD Mechanism Module
DEH-2800MP/XN/UC DEH-2850MP/XN/ES	CRT3554	CXK5752
DEH-2800MP/XN/EW DEH-2800MPB/XN/EW DEH-2820MP/XN/EW DEH-281MP/XN/EW	CRT3555	CXK5752
DEH-3850MP/XU/ES DEH-3850MPH/XU/GS DEH-3850MP/XU/CN	CRT3556	CXK5750
DEH-P3800MP/XU/UC	CRT3557	CXK5750
DEH-P4800MP/XU/EW	CRT3558	CXK5750
DEH-P580MP/XN/UC DEH-P5800MP/XN/UC	CRT3563	CXK5752
DEH-P6800MP/XN/EW	CRT3564	CXK5752
DEH-P5850MP/XN/ES DEH-P5850MPH/XN/GS	CRT3565	CXK5752
DEH-P480MP/XU/UC DEH-P4800MP/XU/UC	CRT3566	CXK5750
DEH-P4850MP/XU/ES DEH-P4850MPH/XU/GS DEH-P4850MP/XU/CN	CRT3567	CXK5750
DEH-P680MP/XN/UC DEH-P6800MP/XN/UC DEH-P6850MP/XN/ES	CRT3569	CXK5752

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1. CIRCUIT DESCRIPTIONS

UPD63763CGJ, multifunctional LSI used in this device, has built-in CD-ROM decoder and MP3/WMA decoder, as shown in Fig.1.0.1, as well as the conventional CD block, allowing to play CD-ROMs, in which MP3/WMA files are recorded, while the recent mainstay of the CD LSI is the LSI integrating the core DSP with DAC or RF amplifier, which are generally used as peripheral circuits.

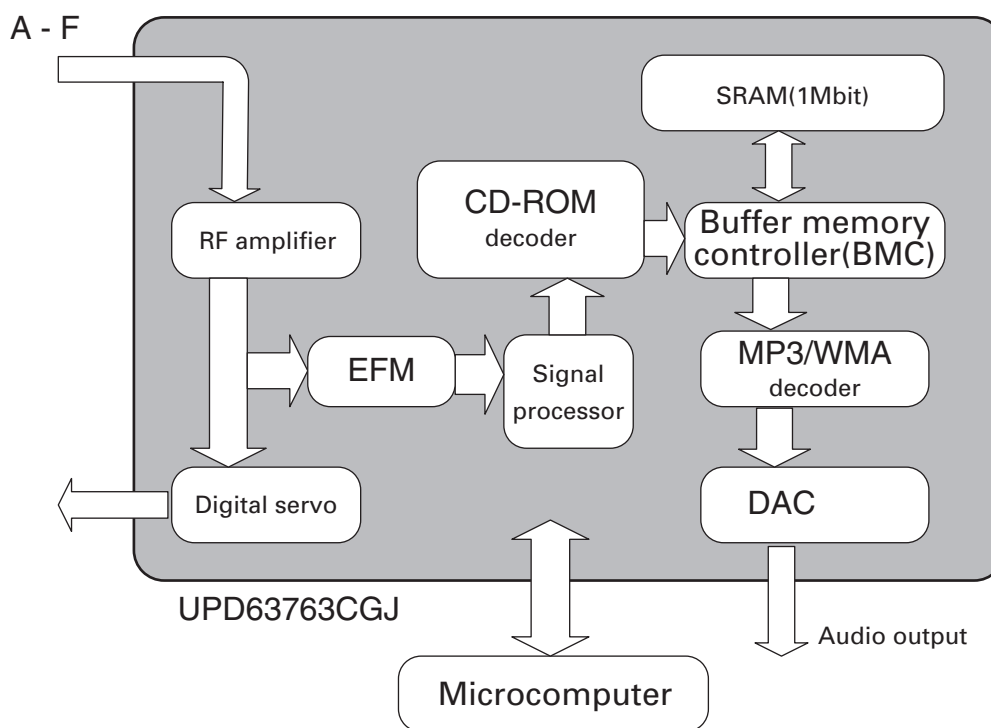


Fig.1.0.1 Block diagram of CD LSI UPD63763CGJ

1.1 PREAMPLIFIER BLOCK (UPD63763CGJ: IC201)

In the preamplifier block, the pickup output signals are processed to generate signals that are used in the subsequent blocks: servo, demodulator, and control blocks. Signals from the pickup are I/V converted in the pickup with the preamplifier with built-in photo detectors, and after added with the RF amplifier, they are used to produce such signals as RF, FE, TE, and TE zero-cross signals. The preamplifier block is built in CD LSI UPD63763CGJ (IC201), whose parts are described individually below. Incidentally, as this LSI employs a single power supply (+ 3.3 V) specification, the reference voltages of this LSI and the pickup are the REFO (1.65 V) for both. The REFO is an output obtained from REFOUT in the LSI via the buffer amplifier, and is output from the pin 133 of this LSI. All measurements will be performed with this REFO as the reference.

Caution: Be careful not to short-circuit the REFO and GND when measuring.

1.1.1 APC (Automatic Power Control) circuit

Since laser diodes have extremely negative temperature characteristics in optical output when driven in constant current, it is necessary to control the current with the monitor diodes in order to keep the output constant. This is the feature of the APC circuit. The LD current is obtained by measuring the voltage between LD1 and V3R3D(+ 3.3 V), and divide the value by 7.5 (ohms), which becomes about 30 mA.

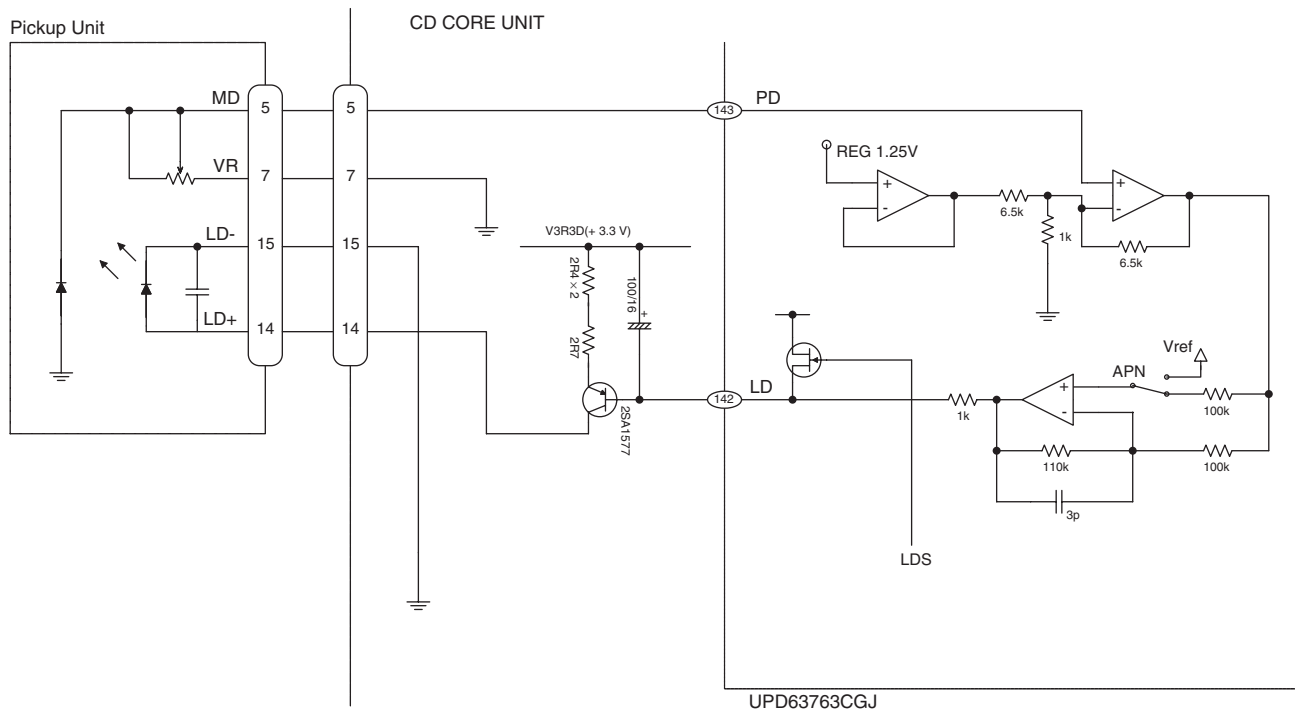


Fig.1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The output from the photo-detector (A + C) and (B + D) is provided from the RFO terminal as the RF signal (which can be used for eye-pattern check), after it is added, amplified, and equalized inside this LSI. The low frequency component of the voltage RFO is calculated as below.

$$RFO = (A + B + C + D) \times 2$$

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFO signal, output from the pin 119, is A/C-coupled externally, input to the pin 118, and amplified in the RFAGC amplifier to obtain the RFAGC signal.

Also, this LSI is equipped with the RFAGC auto-adjustment function, explained below, which switches feedback gains of the RFAGC amplifier so that the RFO output will be 1.5 V.

This RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

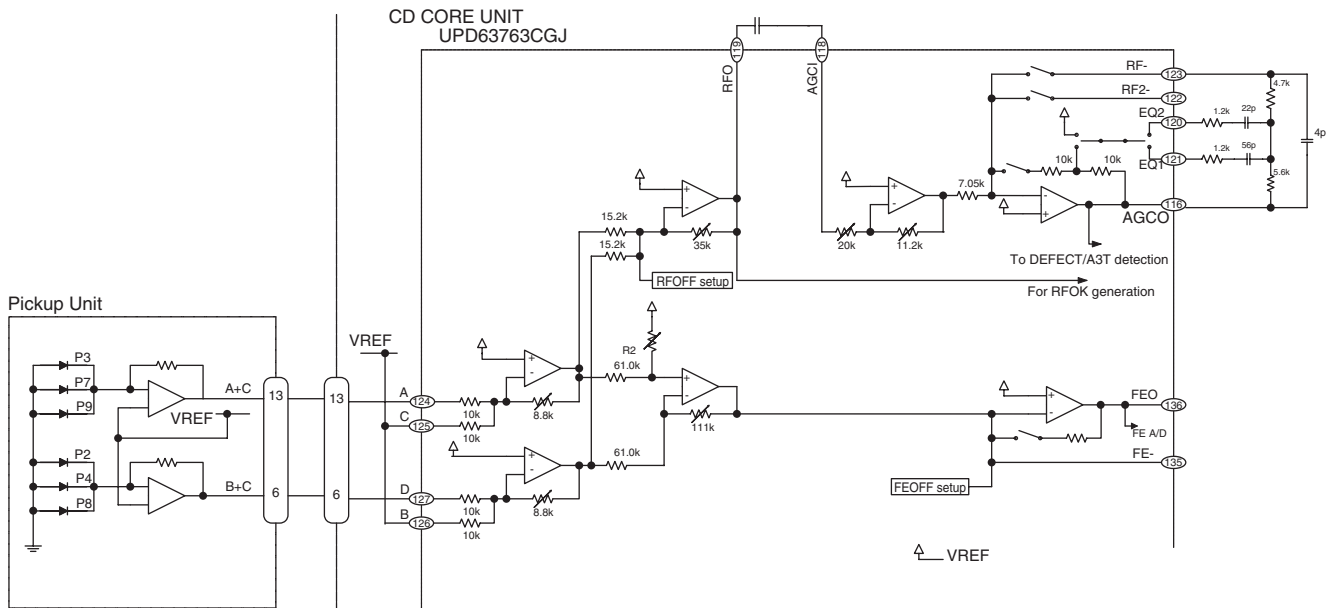


Fig.1.1.2 RF/AGC/FE

A

The photo-detector outputs (A + C) and (B + D) are passed through the differential amplifier and the error amplifier, and (A + C - B - D) is provided from the pin 136 as the FE signal. The low frequency component of the voltage FE is calculated as below.

$$\begin{aligned} \text{FE} &= (A + C - B - D) \times 8.8\text{k} / 10\text{k} \times 111\text{k} / 61\text{k} \times 160\text{k} / 72\text{k} \\ &= (A + C - B - D) \times 3.5 \end{aligned}$$

For the FE outputs, an S-shaped curve of 1.5 Vp-p is obtained with the REFO as the reference. The cutoff frequency for the subsequent stage amplifiers is 14.6 kHz.

1.1.4 RFOK circuit

This circuit generates the RFOK signal, which indicates the timing to close the focus loop and focus-close status during the play mode, from the pin 55. As for the signal, "H" is output in closing the focus loop and during the play mode.

Additionally, the RFOK becomes "H" even in a non-pit area, since the DC level of the RFO signal is peak-held in the subsequent digital block and compared at a certain threshold level to generate the RFOK signal. Therefore, the focus is closed even on a mirror-surface area of a disc. This signal is also supplied to the microcomputer via the low-pass filter as the FOK signal, which is used for protection and gain switching of the RF amplifier.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are passed through the differential amplifier and the error amplifier to obtain (E - F), and then provided from the pin 139 as the TE signal. The low frequency component of the voltage TE is calculated as below.

$$\begin{aligned} \text{TEO} &= (E - F) \times 63k / 112k \times 160k / 160k \times 181k / 45.4k \times 160k / 80k \\ &= (E - F) \times 4.48 \end{aligned}$$

For the TE output, TE waveform of about 1.3 Vp-p with the REFO as the reference. The cutoff frequency in the subsequent is 21.1 kHz.

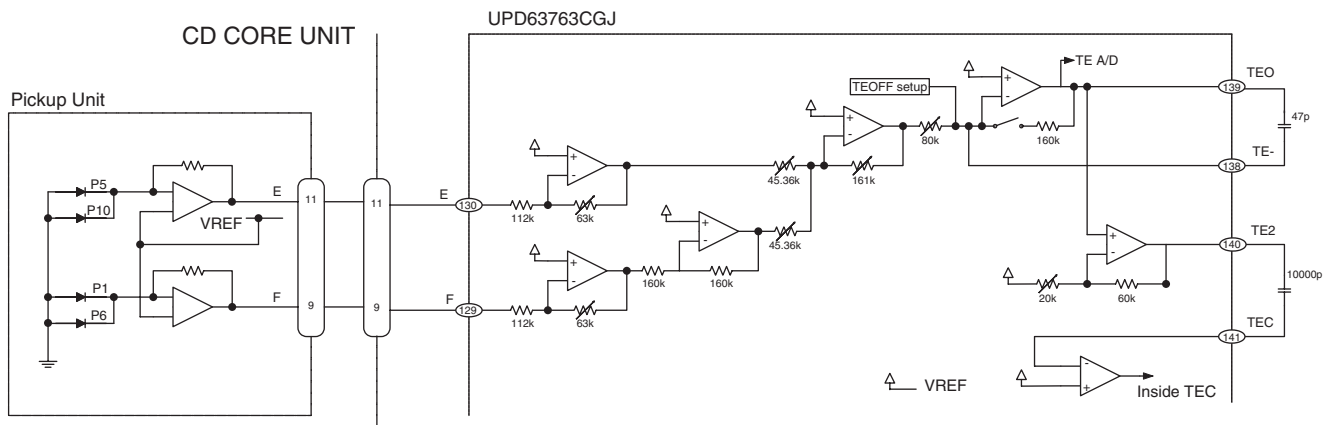


Fig.1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter referred to as TEC signal) is obtained by amplifying the TE signal by fourfold, and used to detect the tracking-error zero-cross point. As the purpose of detecting the zero-cross point, the following two points can be named:

1. To use for track-counting in the carriage move and track jump modes
2. To use for detecting the direction in which the lens moves in tracking close. (Used in the tracking brake circuit to be explained later.)

The frequency range of the TEC signal is from 300 Hz to 20 kHz, and

TEC voltage = TE level x 4

The TEC level can be calculated at 4.62 V, which, at this level, exceeds the D range of the operational amplifier, and clips the signal, but, because the CD LSI only uses the signal at the zero-cross point, it poses no particular problem.

1.1.7 EFM circuit

The EFM circuit converts the RF signal into digital signals of 0 and 1. The AGCO signal output from the pin 116 is A/C-coupled externally, input to the pin 114, and supplied to the EFM circuit.

Missing RF signal due to scratches and stains on the disc, and asymmetry of the upper and lower parts of the RF, caused by variation in disc production, cannot be entirely eliminated in AC coupling process, the reference voltage ASY of the EFM comparator is controlled, using the probability that 0 and 1 occur at 50%. Thus, the comparator level will always stay around the center of the RFO signal. This reference voltage ASY is generated by passing the EFM comparator output through the low-pass filter. The EFM signal is output from the pin 111.

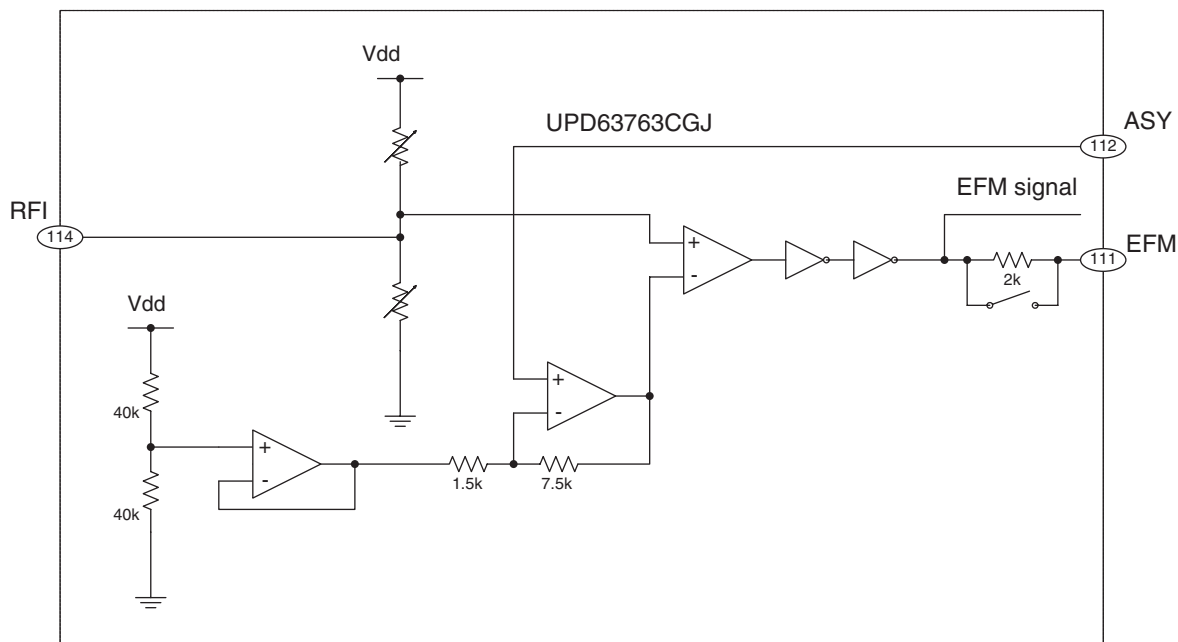


Fig.1.1.4 EFM

1.2 SERVO BLOCK (UPD63763CGJ: IC201)

The servo block performs servo control such as error signal equalizing, in-focus, track jump and carriage move. The DSP block is the signal-processing unit, where data decoding, error correction, and compensation are performed. The FE and TE signals, generated in the preamplifier stage, are A/D-converted, and output drive signals for the focus, tracking, and carriage systems via the servo block. Also, the EFM signal is decoded in the signal-processing unit, and ends up in outputting D/A-converted audio signals through the D/A converter. Furthermore, in this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to output the spindle drive signal.

Each drive signal for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are output as PWM3 data, and then converted to analog data through the LPF. These drive signals, after changed to analog form, can be monitored with the FIN, TIN, CIN, and SIN signals, respectively. Subsequently, the signals are amplified and supplied to the actuator and motor for each signal.

1.2.1 Focus servo system

The main equalizer of the focus servo consists of the digital equalizer block. The figure 1.2.1 shows the block diagram of the focus servo system.

In the focus servo system, it is necessary to move the lens within the in-focus range in order to close the focus loop. For that purpose, the in-focus point is looked for by moving the lens up and down with the focus search voltage of triangular signal. During this time, the rotation of the spindle motor is retained at a certain set speed by kicking the spindle motor.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus-close operations at an appropriate timing. The focus-close operation is performed when the following three conditions are satisfied at the same time:

- 1) The lens moves toward the disc surface.
- 2) RFOK = "H"
- 3) The FE signal is zero-crossed.

Consequently, the FE converges to "0" (= REFO).

When the above-mentioned conditions are met and the focus loop is closed, the FSS bit is shifted from "H" to "L," and then, in 10 ms, the microcomputer starts monitoring the RFOK signal obtained through the low-pass filter.

If the RFOK signal is determined to be "L," the microcomputer takes several actions including protection.

Fig.1.2.2 shows a series of actions concerning the focus close operations. (It shows a case where the focus loop cannot be closed.)

With the focus mode selector displaying 01 in the test mode, pressing the focus close button, allows to check the S-shaped curve, search voltage, and actual lens behavior.

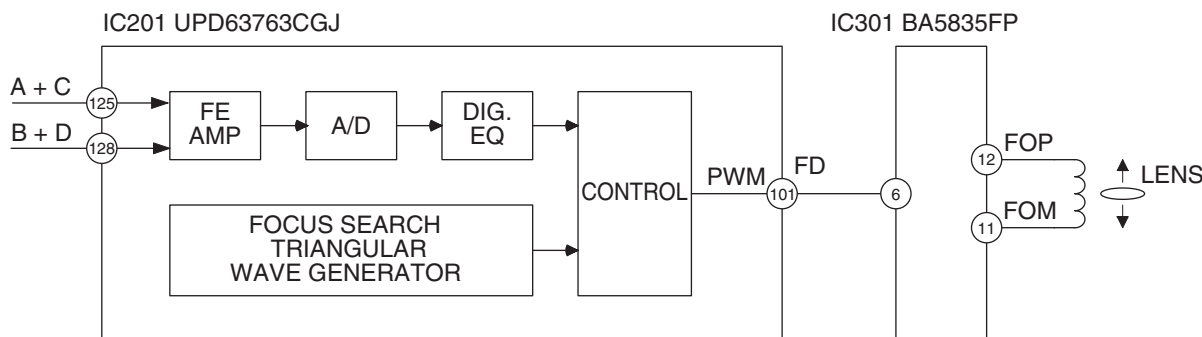


Fig.1.2.1 Block diagram of the focus servo system

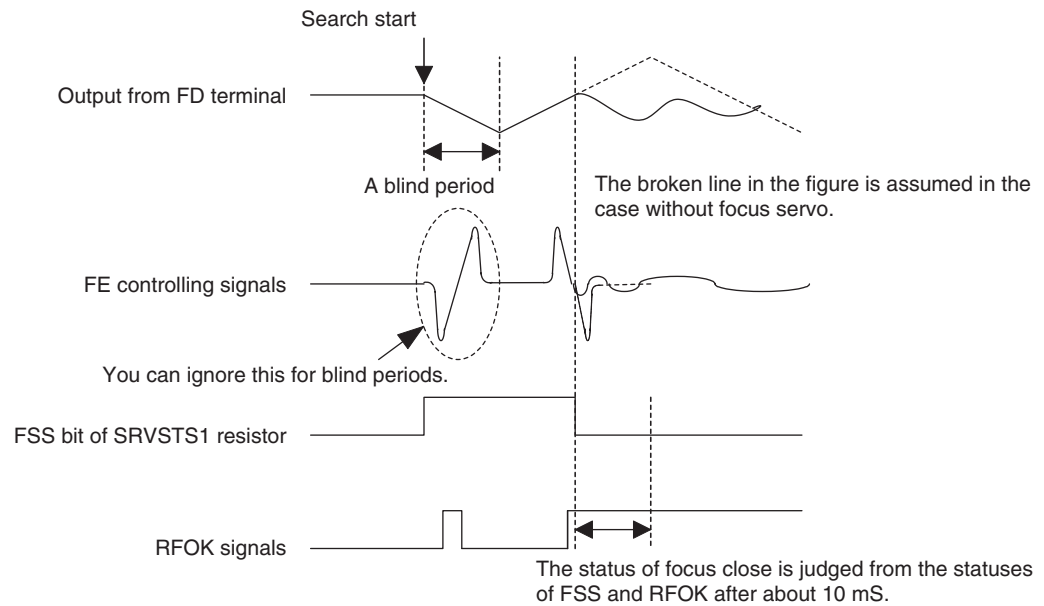


Fig.1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

The main equalizer of the tracking servo consists of the digital equalizer block. The figure 1.2.3 shows the block diagram of the tracking servo system.

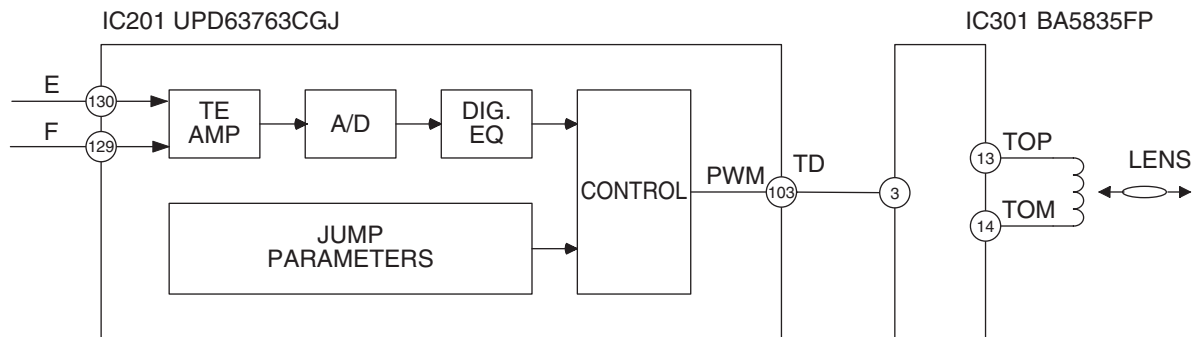


Fig.1.2.3 Block diagram of the tracking servo system

(a) The track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the microcomputer. For the track jumps used in the search mode, a single track jump and four to 100 multi-track jump are available in this system. In the test mode, out of these track jumps, 1, 32, and 32×3 track jumps, as well as carriage move can be performed and checked in mode selection. In a track jump, the microcomputer sets about half the number of the total tracks to jump (about five tracks for a 10-track jump), and the set number of tracks are counted using the TEC signal. By outputting the brake pulse for a certain period of time (set by the microcomputer) from the time the set number is counted, and stopping the lens, the tracking loop can be closed so that the normal play can be continued.

Also, in order to facilitate closing of the tracking loop in a track jump, the brake circuit is kept ON for 50 msec, after the brake pulse is stopped, for increasing the tracking servo gain. The FF/REW action in the normal operation mode is realized by performing single jumps consecutively. The speed is approximately 10 times faster than in the normal mode.

(b) Brake circuit

Since the servo loop is not closed very well in the setup mode and track jump mode, the brake circuit is used for stabilizing the servo-loop close operation. The brake circuit detects the direction in which the lens moves, and outputs only the drive signal for the direction opposite to the movement to slow down the lens, thereby stabilizing the tracking servo-loop close operation. Additionally, the off-track direction is determined from the TEC and MIRR signals, as well as their phase relation.

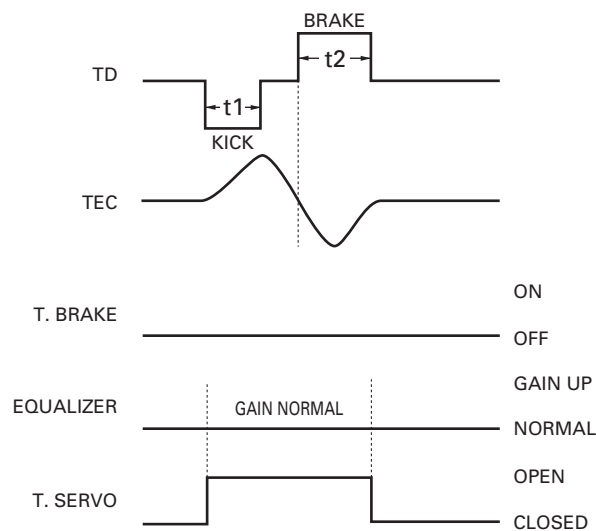


Fig.1.2.4 Single-track jump

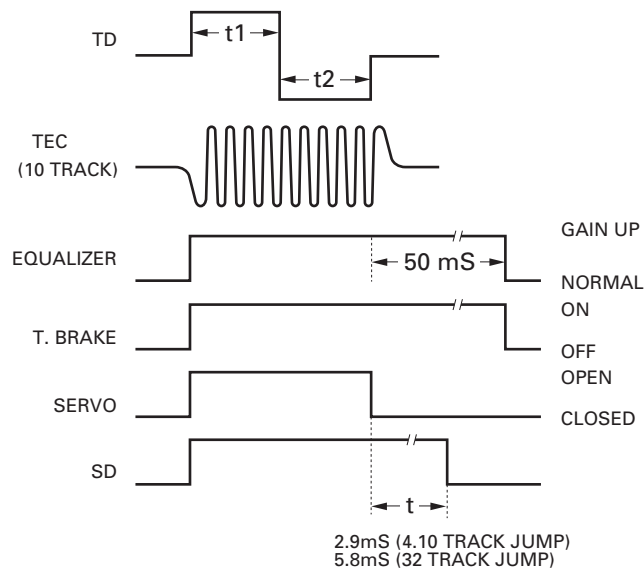
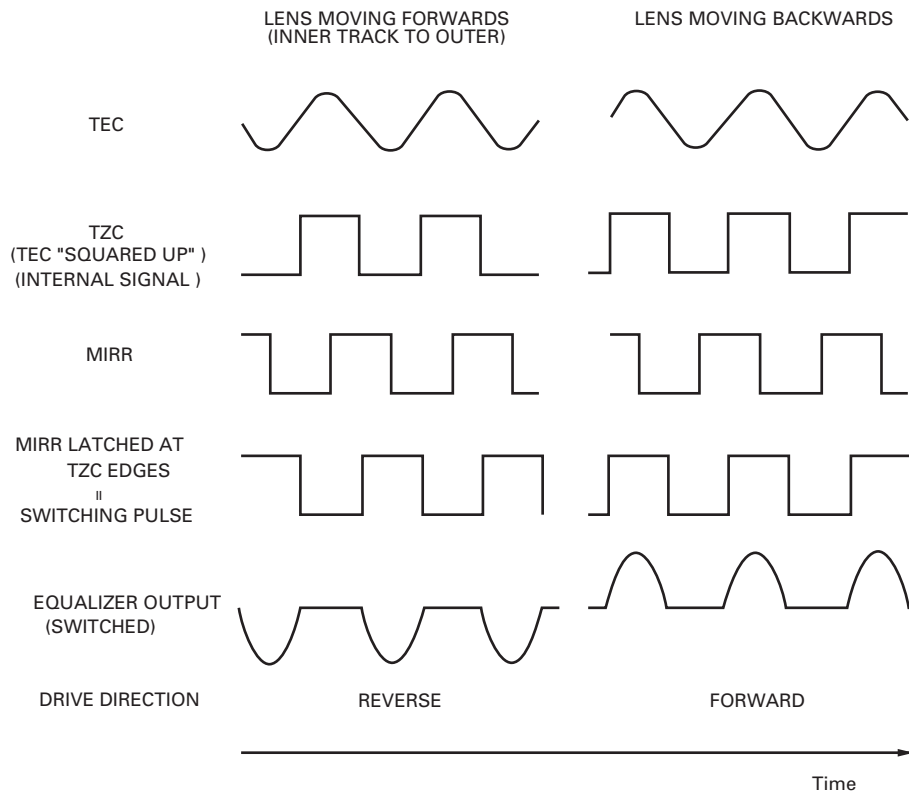


Fig.1.2.5 Multi-track jump



Note : Equalizer output assumed to have same phase as TEC.

Fig.1.2.6 Track brake

1.2.3 Carriage servo system

The carriage servo system inputs the output of the low frequency component from the tracking equalizer (information on the lens position) to the carriage equalizer, and, after the gain is increased to a certain level, outputs the drive signal from the LSI. This signal is applied to the carriage motor via the driver IC.

Specifically, since it is necessary to move the whole pickup to the FORWARD direction when the lens offset reaches a certain level during the play mode, the equalizer gain is set to output higher voltage than the carriage motor starting voltage at this time. In actual operations, a certain threshold level is preset in the servo LSI for the equalizer output, and only when it exceeds the threshold level, the drive voltage will be output. This can reduce the power consumption. Also, before the whole pickup starts moving, the equalizer output voltage may exceed the threshold level a few times, due to such causes as eccentricity of discs. In this case, the output waveform of the drive voltage from the LSI assumes a pulse-like form.

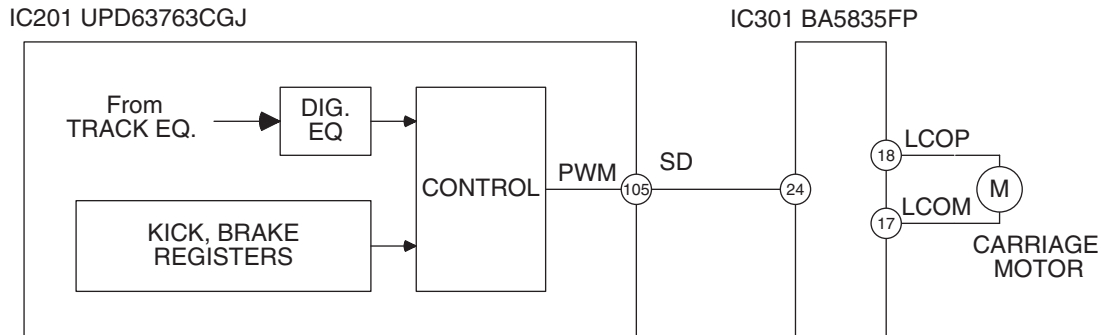


Fig.1.2.7 Block diagram for the carriage servo block

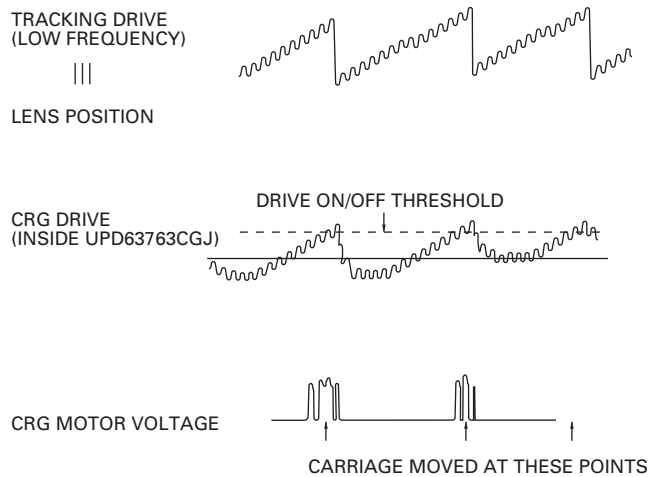


Fig.1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following modes are available:

1) Kick

Used to accelerate the disc rotation in the setup mode.

2) Offset

a. Used in the setup mode after the kick mode, until the TBAL adjustment is completed.

b. Used during the play mode when the focus loop is unlocked, until it is locked again.

In both cases, the mode is used to keep the disc rotation approximately normal.

3) Applicable servo

CLV servo mode, used in the normal operation.

In the EFM demodulation block, by WFC/16 sampling whether the frame sync signal and the internal frame counter output are synchronized, a signal is created to show if they are "in-sync" or "non-sync." The status is not recognized as asynchronous until the signal is "non-sync" for eight consecutive times; otherwise it is recognized as synchronous. In the applicable servo mode, the leading-in servo mode is automatically selected in the asynchronous status, and the normal servo mode in the synchronous status.

4) Brake

Used to stop the spindle motor.

In accordance with the microcomputer's command, the brake voltage is sent out from the servo LSI. At this time, the EFM waveform is monitored in the LSI, and when the longest EFM pattern exceeds a certain interval (or the rotation slows down enough), a flag is set inside the LSI, and the microcomputer switches off the brake voltage. If a flag is not set within a certain period, the microcomputer shifts the mode from the brake mode to the stop mode, and retains the mode for a certain period of time. If the mode switches to this stop mode in the eject operation, the disc will be ejected after the period of time mentioned above elapses.

5) Stop

Used when the power is turned on and during the eject operation. In the stop mode, the voltage in both ends of the spindle motor is 0 V.

6) Rough servo

Used in carriage feed (carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, the "H" or "L" level is input to the spindle equalizer. In the test mode, this mode is also used for grating confirmation.

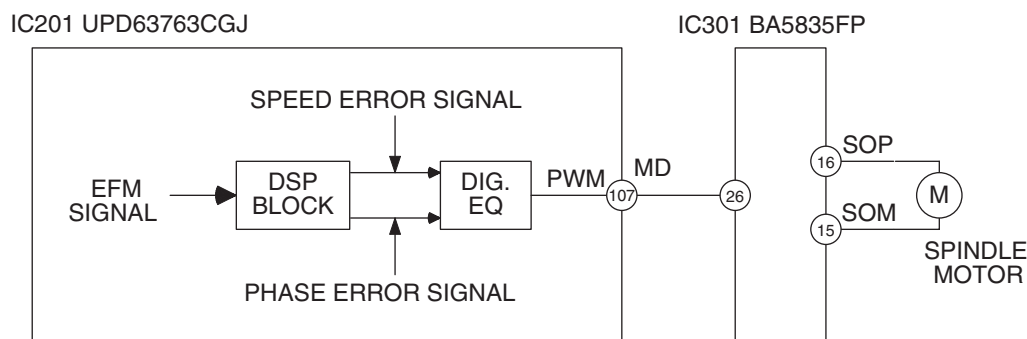


Fig.1.2.9 Block diagram of the spindle servo system

1.3 AUTOMATIC ADJUSTMENT FUNCTION

In this system, all the circuit adjustments are automated inside the CD LSI.

All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key. Details of each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

In this adjustment the TE, FE, and RF amplifier offsets of the preamplifier block in POWER ON are adjusted to the respective target values with the REFO as reference. (The target values for TE, FE, and RF offsets are 0 V, 0 V, and - 0.8 V, respectively.)

Adjusting procedure

- 1) The microcomputer reads respective offsets through the servo LSI, when they are in LDOFF status.
- 2) The microcomputer calculates the voltages for correction from the values read in 1), and substitutes the corrected values to prescribed places to adjust.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment equalizes the output difference of the E-ch and F-ch from the pickup by changing the amplifier gain inside the LSI. In actual operation, adjustment is performed so that the TE waveform becomes symmetrical on each side of the REFO.

Adjusting procedure

- 1) After closing the focus loop,
 - 2) Kick the lens in the radial direction to ensure the generation of the TE waveform.
 - 3) The microcomputer reads the offset amount of the TE signal calculated in the LSI at the time through the servo LSI.
 - 4) The microcomputer determines the offset amount is 0, positive, or negative.
 - When the offset amount is 0, the adjustment is completed.
 - When the offset amount is positive or negative, the amp gains for E-ch and F-ch should be changed, following a certain rule.
- Then, steps 2) to 4) are repeated until the offset amount becomes 0 or the repetition reaches the limit number of times.

1.3.3 FE bias auto-adjustment

This adjustment is to maximize the RFO level by optimizing the focus point during the play mode, utilizing the phase difference between the 3T level waveform of the RF waveform and that of when focus error disturbance is input. This adjustment is performed at the same timing as the auto-gain control, which will be described later, since disturbance is input to the focus loop.

Adjusting procedure

- 1) The microcomputer issues the command to introduce disturbance to the focus loop (inside the servo LSI).
- 2) The waver of the 3T component of the RF signal is detected in the LSI.
- 3) The relation between the 3T component above and the disturbance is processed inside the LSI to detect the volume and direction of the focus offset.
- 4) The microcomputer issues a command and reads out the detected results from the servo LSI.
- 5) The microcomputer calculates the necessary correction and substitutes the result to the bias adjustment term inside the servo LSI.

Additionally, in this adjusting, a series of steps are repeated for better adjustment accuracy, the same as in the auto-gain control.

1.3.4 Focus and tracking AGC

This adjustment is to automatically adjust the focus and tracking servo loop gains.

Adjusting procedure

- 1) Introduce disturbance to the servo loop.
 - 2) The error signals (FE and TE) when disturbance is introduced are extracted through the band pass filter, to obtain the G1 and G2 signals.
 - 3) The microcomputer reads the G1 and G2 signals through the servo LSI.
 - 4) The microcomputer calculates the necessary correction and performs the loop gain adjustment inside the servo LSI.
- For increased adjustment accuracy, the same adjustment process is repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment is to adjust the dispersion of the RF level (RFO), which may be caused by mechanism or disc-related factors, to a steady value for reliable signal transmission. The adjustment is performed by changing the amp gain between RFO and RFAGC.

Adjusting procedure

- 1) The microcomputer issues a command and reads out the output from the RF level detection circuit inside the servo LSI.
- 2) From the read values, the microcomputer calculates the amp gain to change the RFAGC level to the target.
- 3) The microcomputer sends a command to the servo LSI to adjust the amp gain to the level calculated in 2).

This adjustment is performed

- 1) when only the focus close operation is completed during the setup mode, and
- 2) immediately before the setup is completed (or when the play mode is about to start).

1.3.6 Adjustment of gains in preamplifier stage

In this adjustment, when reflected beams from the disc surface are extremely weak, such as when the lens is dirty, or a CD-RW is played, gains in the whole RFAMP block (FE, TE, and RF amplifiers) are increased by + 6 dB or + 12 dB, depending on the situation.

Adjusting procedure

When the system determines that the reflected beams from the disc surface are extremely weak during the setup mode, the whole RFAMP gains will be increased by + 6 dB or + 12 dB.

1.3.7 Initial values in adjustment

All automatic adjustments immediately after inserting a disc are performed based on the initial values. Automatic adjustments by source change or ACC ON are basically performed using the previous adjustment values as the initial values.

1.3.8 Coefficient display of adjustment results

For some of the adjustments (FE and RF offset, FZD cancel, F and T gains, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

The coefficient display in each auto adjustment is as follows:

1) FE and RF offset

Reference value = 32 (coefficient of 32 indicates that no adjustment is required)

The value is displayed in the unit of approximately 32mV.

Ex. When the FE offset coefficient is 35,

$$35 - 32 = 3 \times 32 \text{ mV} = 96 \text{ mV}$$

The correction is about +96 mV, which means the FE offset before adjustment is - 96 mV.

2) F and T gain adjustment

Reference value for focus and tracking = 20

The displayed coefficient / the reference value indicates the adjusted gain.

Ex. When the AGC coefficient is 40,

adjustment of $40 / 20 = 2$ times (+ 6 dB) has been performed.

(It means that the original loop gain was half the target, and the whole gain was doubled to obtain the target value.)

3) RF level adjustment (RFAGC)

Reference value = 8

The coefficient of 9 to 15 indicates to increase the RF level
(for more gains).

The coefficient of 7 to 10 indicates to decrease the RF level
(for less gains).

When the coefficient changes by 1, the gain changes by 0.7 to 1 dB.

When the coefficient is 15, the gain is the maximum at TYP + 7.9 dB.

When the coefficient is 0, the gain is the minimum at TYP - 4.6 dB.

1.4 POWER SUPPLY AND LOADING BLOCK

For the power supply for this system, the VD (7.5 ± 0.5 V) and the VDD (5.0 ± 0.25 V), which are supplied from the motherboard, are used. The three power supplies, the VD mentioned above (for the drive system), the V3R3D obtained from the VD via the 3.3 V regulator (for the control system: 3.3 V) and the VDD (for the microcomputer: 5 V), are used in this system.

The microcomputer controls ON/OFF with "CONT", except for Load/Eject of the CD driver, and ON/OFF of 3.3 V with "CD3VON". For ON/OFF of the Loading drive, no particular control terminals are available, but the input signal "LOEJ" assumes an equivalent role. Also, the LCO output switches LOADING MODE and CARRIAGE MODE with "CLCONT".

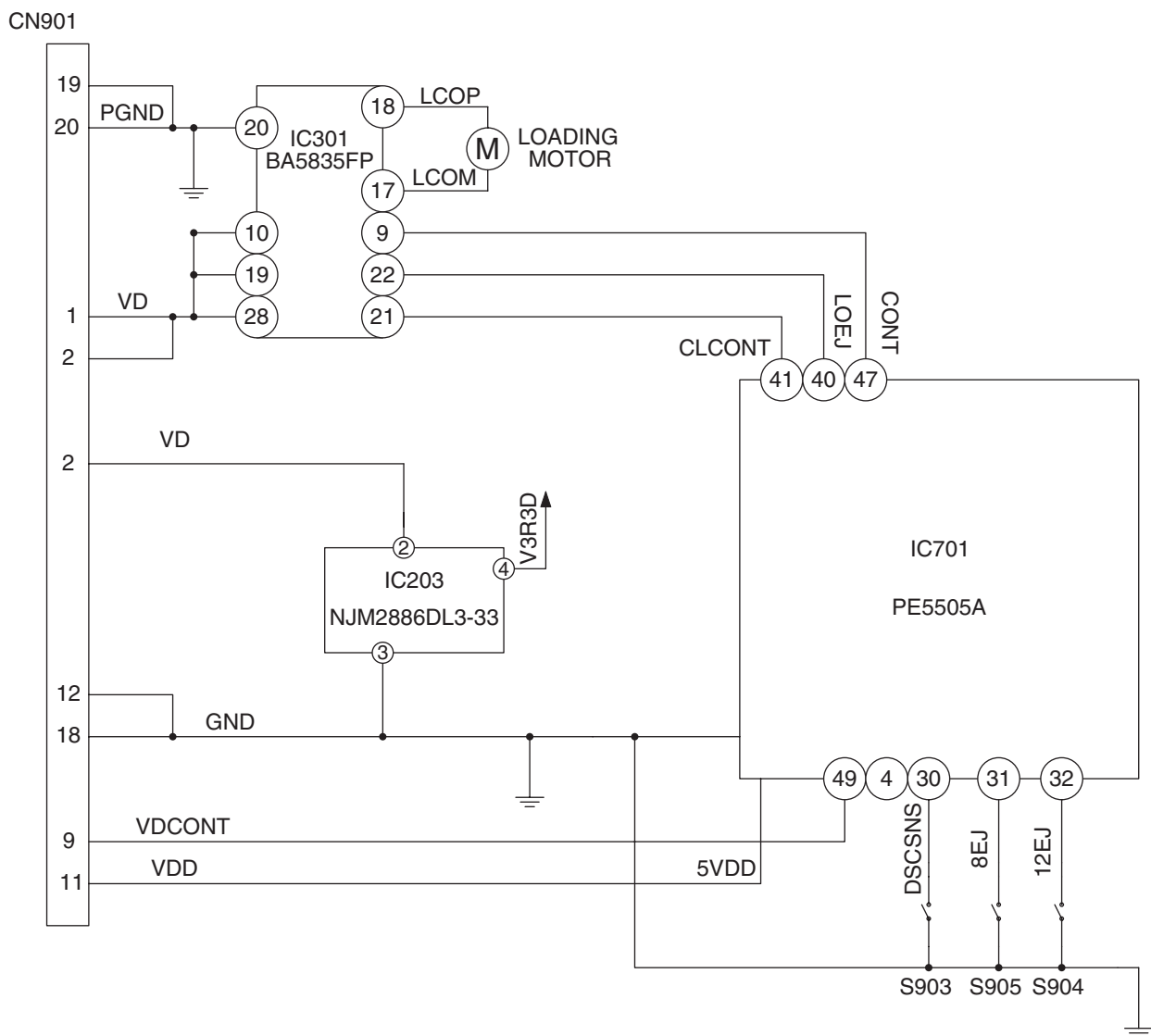


Fig.1.4.1 Power supply/loading system circuit block

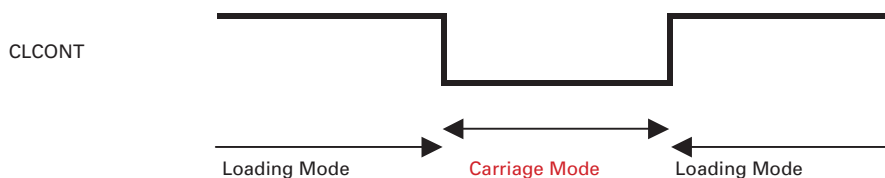


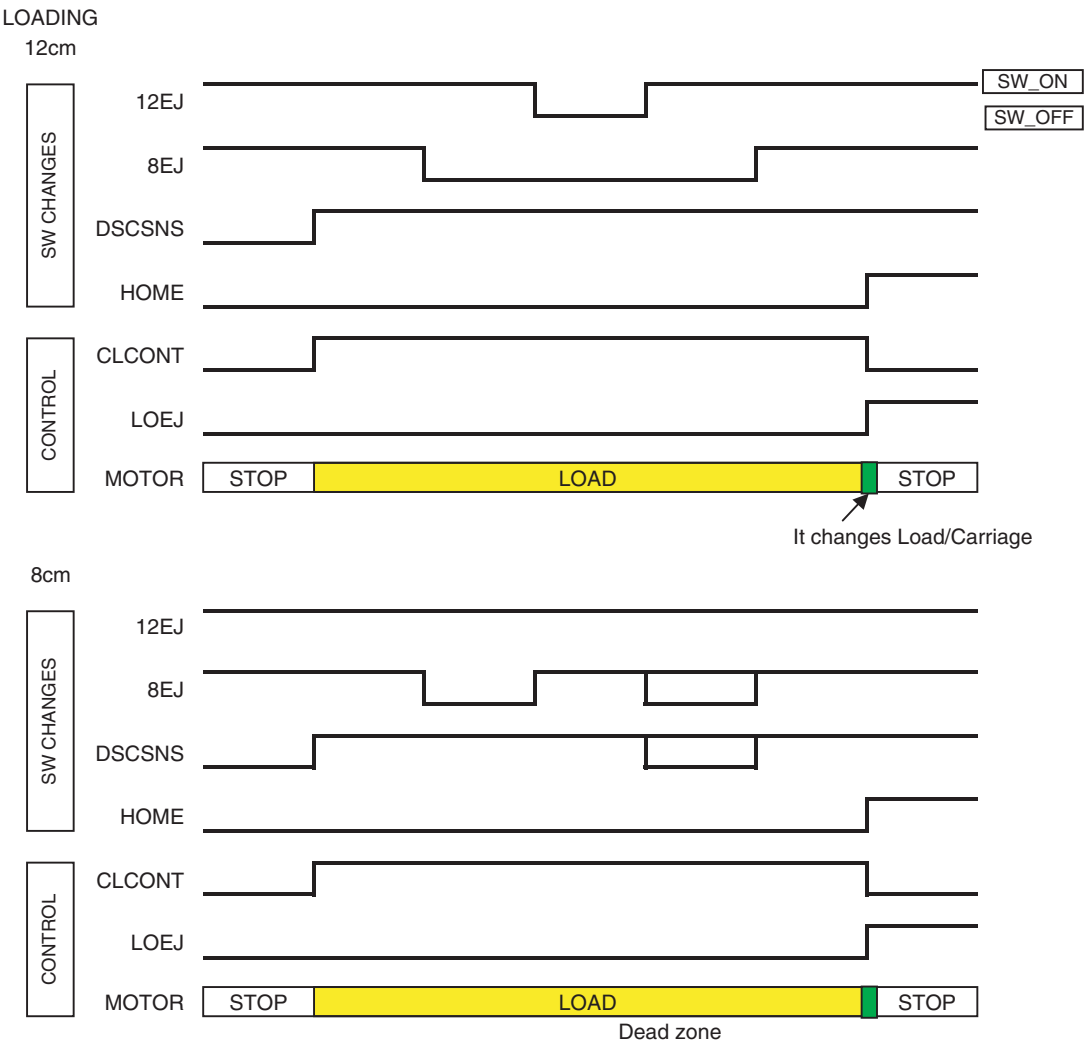
Fig.1.4.2 Loading/carriage mode shift

The load/eject operation is controlled with the status changes of the HOME switch (also used for clamp detection) on the mechanism unit and the three switches on the control unit. The ON/OFF statuses of these switches are respectively detected at the input port of the microcomputer.

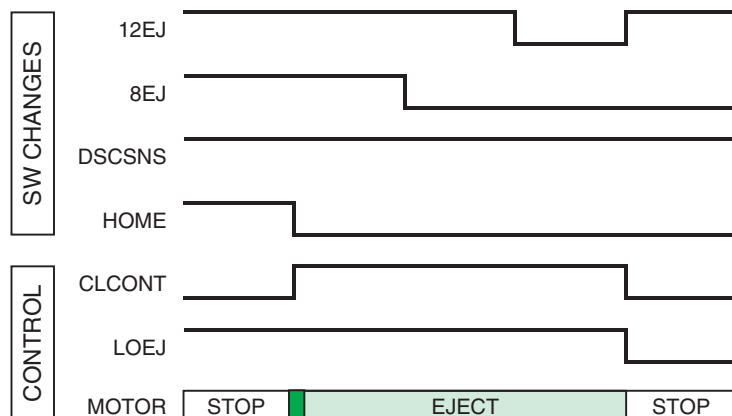
Using the detection results in the microcomputer, each status (A to E) is determined. The disc size detection (8 or 12 cm) is also performed through this status change. Each status is shown in Fig.1.4.3 and the status change in Fig.1.4.4.

Status	A	B	C	D	E
DSCSNS	SW1(S903)	OFF	ON	ON	ON
8SW	SW2(S905)	ON	ON	OFF	OFF
12SW	SW3(S904)	ON	ON	OFF	OFF
HOME	SW4(S901)	OFF	OFF	OFF	ON
Mechanism state	With no disc				Clamp state

Fig.1.4.3 DSCSNS status



EJECT
12cm



8cm

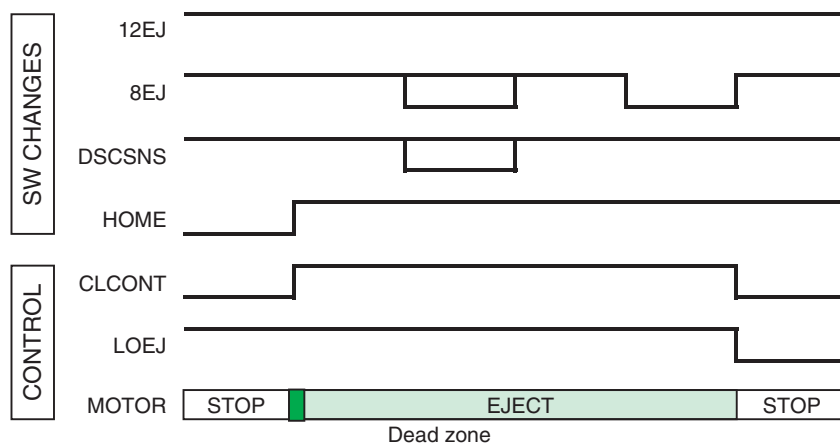
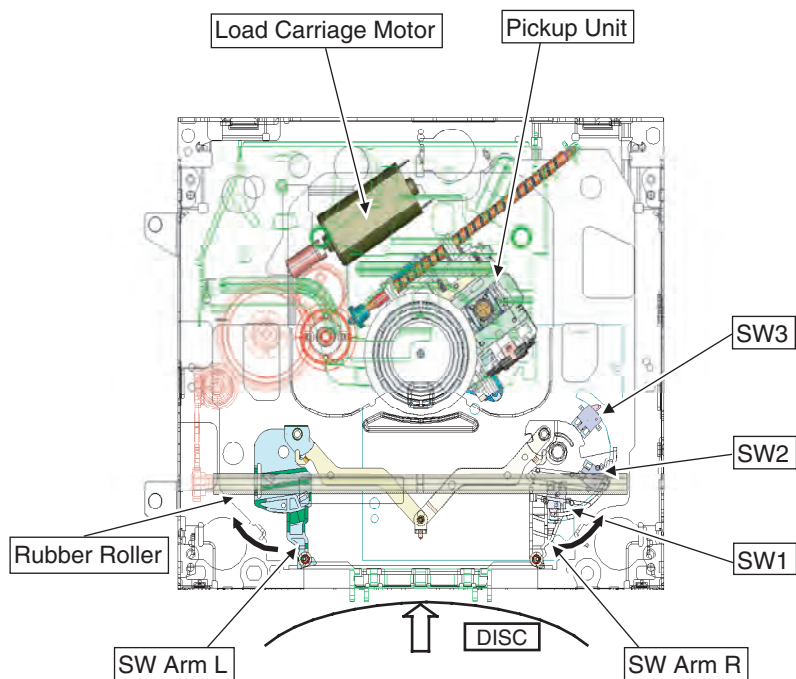


Fig.1.4.4 Status change in LOAD and EJECT modes

2. MECHANISM DESCRIPTIONS

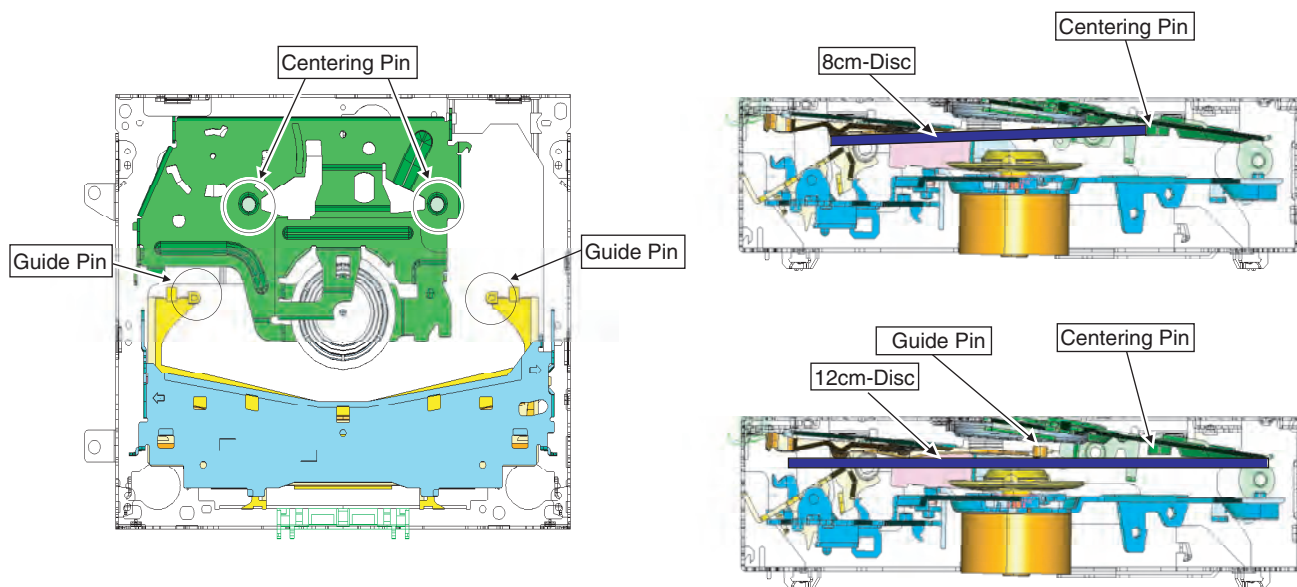
● Loading actions

1. When a disc is inserted, SW Arm L and R rotate and SW1 is switched from ON to OFF.
When SW1 is switched from ON to OFF, the Load Carriage Motor is started and the rubber roller rotates.
2. If the disc is a 12cm-disc, SW3 is turned ON with SW Arm, and the microcomputer determines that the disc is a 12cm-disc.
3. In case of an 8cm-disc, SW3 is not turned ON, a clamp action is triggered, and the microcomputer determines that the disc is an 8cm-disc.
(The left and right of SW Arm are coupled, and when only one side is pushed, the coupled joint will lock, and the arms will not open more than a certain width (SW3 will not be turned ON).)



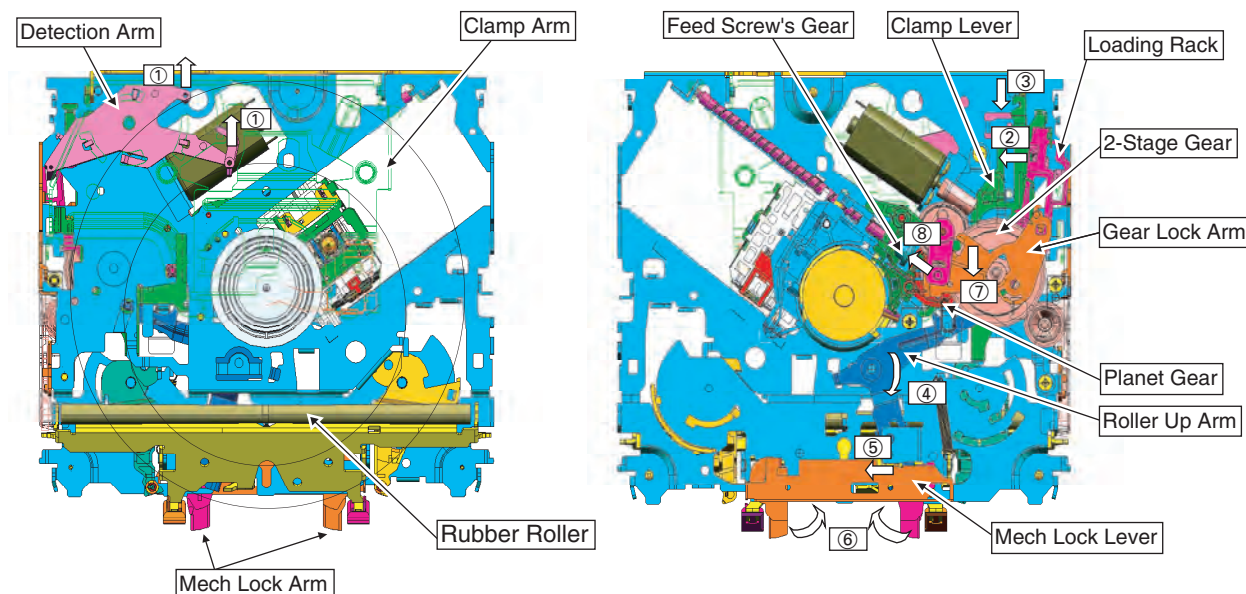
● Disc centering mechanism

1. 8cm-disc is centered by the Guide Pins and the Centering Pins.
2. 12cm-disc passes under the Guide Pins and the Centering Pins, and centered in the back position of the mechanism.



● Clamp actions mechanism

1. With an 8 or 12cm-disc centered on the spindle, the Detection Arm is moved.
2. The movement of the Detection Arm engages the Loading Rack with the 2-Stage Gear.
3. The Clamp Lever slides and lowers the Clamp Arm (the disc is clamped).
At the same time, the Roller Up Arm is rotated, and the Rubber Roller is separated from the disc.
- Also the arm slides the Mechanical Lock Lever, turns the Mechanical Lock Arm, and releases the mechanical lock, completing the clamp operation.
4. When the clamp action is completed, the Clamp Lever rotates the Gear Lock Arm.
- When the arm is rotated, the Planet Gear is separated from the 2-Stage Gear and engaged with the gear of the pickup feed screw, and the carriage operation will start



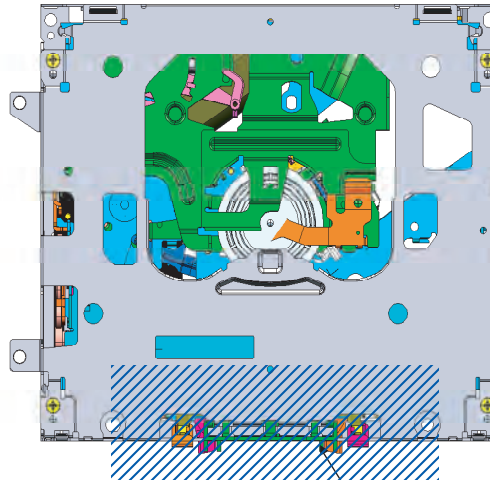
● Eject actions

1. When the Load Carriage Motor is rotated backward, and the pickup is fed to the inner periphery passing the home SW ON point, the eject action will start in the reverse order of the procedure mentioned earlier.
2. For a 12cm-disc, Eject is completed when SW3 is switched OFF, ON, and OFF again.
3. For an 8cm-disc, Eject is completed when SW2 is switched OFF, ON, and OFF again.

3. DISASSEMBLY

● How to hold the Mechanism Unit

1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.

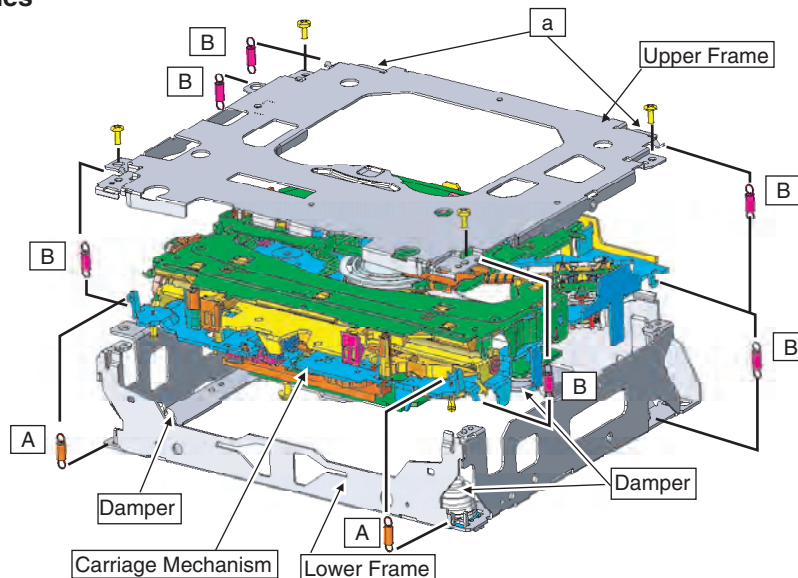


Do not squeeze this area.

● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

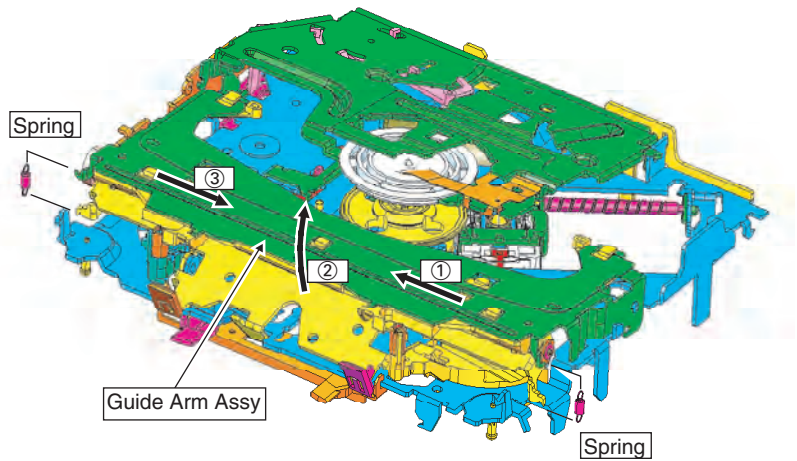
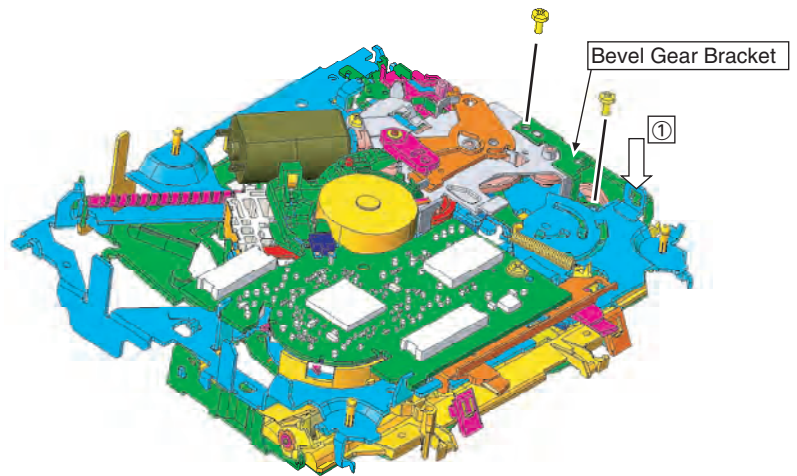
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.



● Removing the Guide Arm Assy

1. Remove the Upper and Lower Frames and set the mechanism to the eject mode.
2. Remove the two Screws and Bevel Gear Bracket. (Note that the gears will come off.)
3. Remove the two Springs from the left and right sides.
4. Slide the Guide Arm Assy to the left, and turn it upward.
5. When it is turned about 45 degrees, slide it to the right and remove.

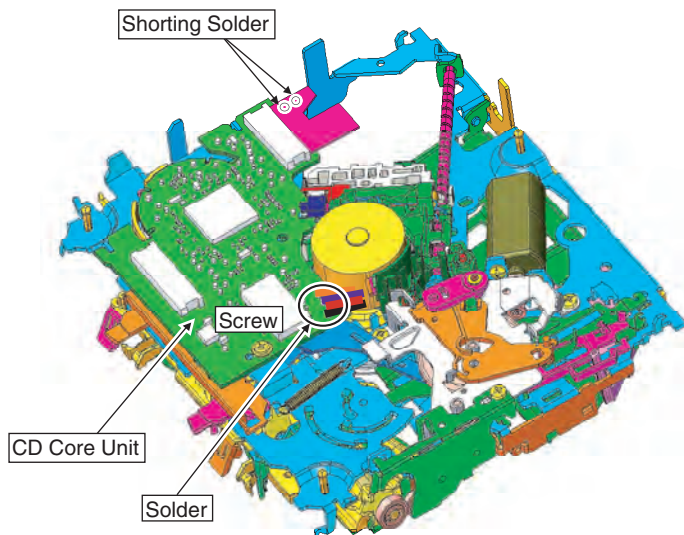
Caution: When assembling, assemble with the Bevel Gear Bracket moved to the direction of the arrow (①).



● How to remove the CD Core Unit

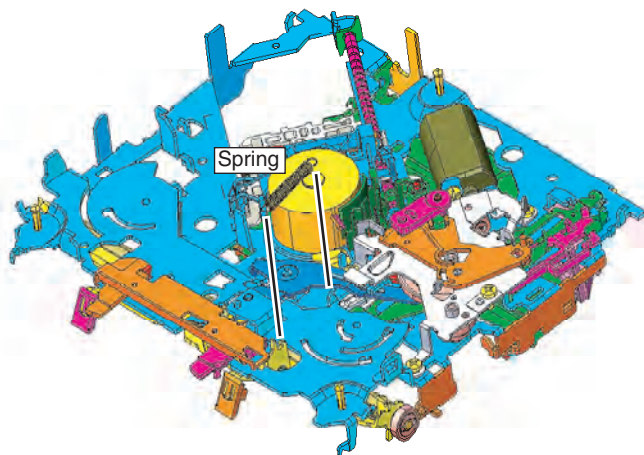
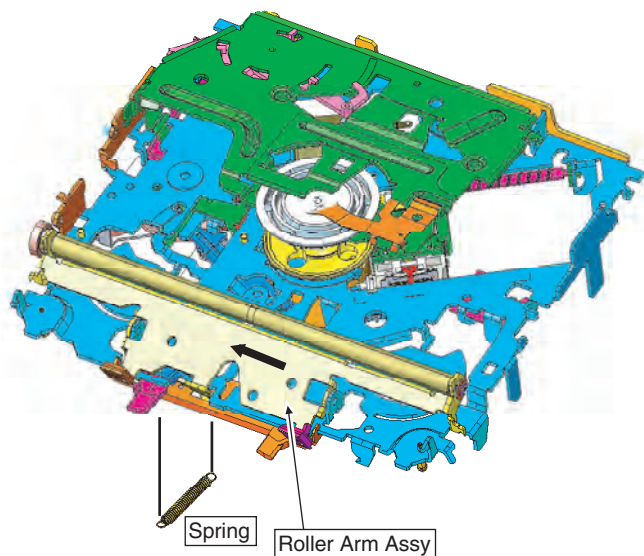
1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



● How to remove the Roller Arm Assy

1. Remove the Guide Arm Assy.
2. Remove the CD Core Unit. (If the Spring can be removed, the unit need not be removed, depending on the type of CD Core Unit.)
3. Remove the Spring.
4. Slide the Roller Arm Assy to the left.

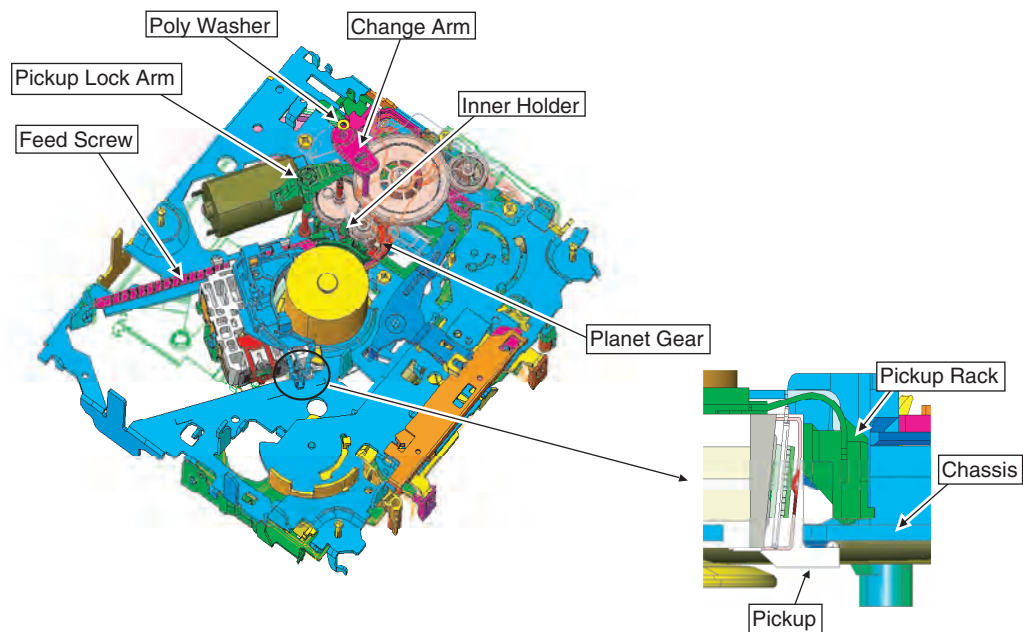


● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.

Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.

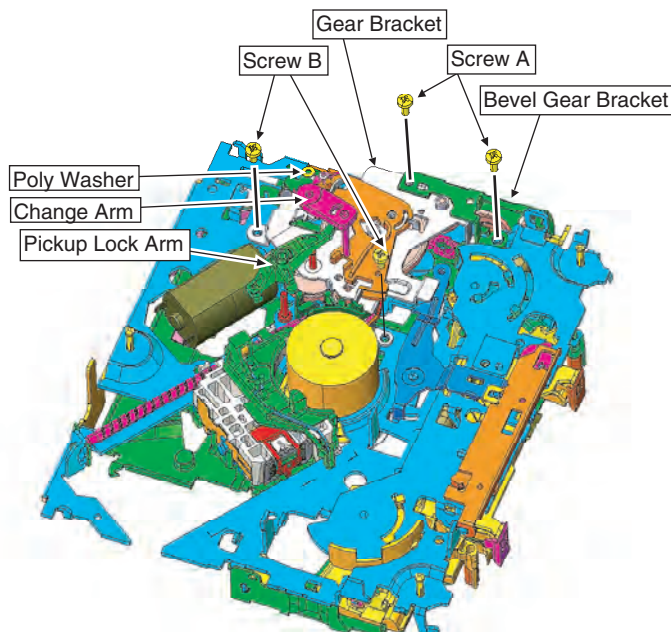


● How to remove the Load Carriage Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Release the leads (orange and purple) of Load Carriage Motor Assy from the CD Core Unit and remove the holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. Remove the two Screws (A) and the Bevel Gear Bracket (Note that the gears will come off).
5. Remove the two Screws (B) and the Gear Bracket (remove the CD Core Unit, if necessary), and remove all the gears.
6. Remove the two Screws (C) and the Load Carriage Motor Assy.

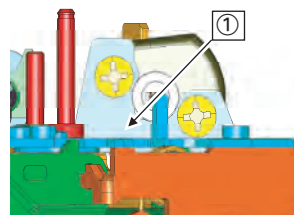
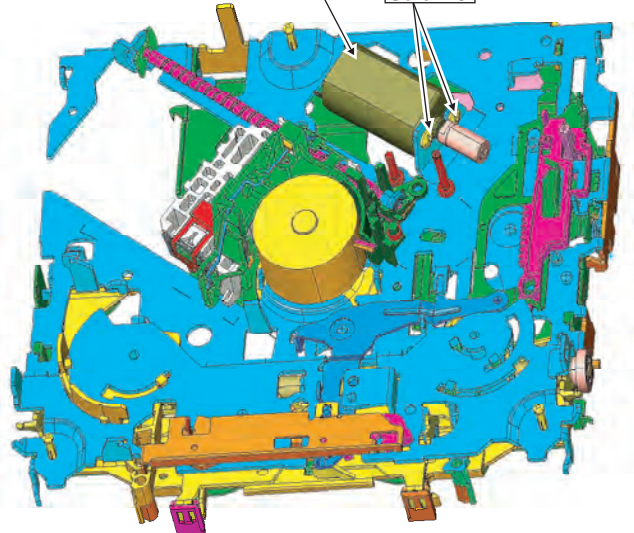
Caution: When assembling the Load Carriage Motor Assy, move it to the direction shown in the illustration (①).

When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



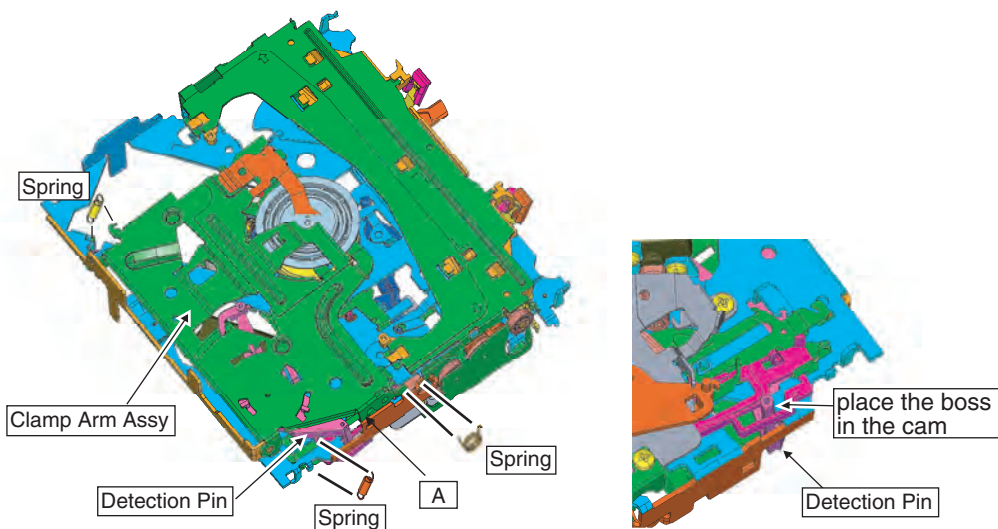
Load Carriage Motor Assy

Screw C



● How to remove the Clamp Arm Assy

1. Make the system in the carriage mechanism mode, and set the mechanism to the eject mode.
 2. Remove the three Springs.
 3. While pressing the position A, turn the Clamp Arm Assy upward, slide it to the left, and remove.
- Caution: When assembling, place the boss of the Detection Pin in the cam unit of the Loading Rack.



● How to remove the Spindle Motor Assy

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Set the mechanism to the eject mode and remove the Clamp Arm Assy.
4. Set the mechanism to the clamped and move the Pickup to circumference.
5. Remove the two Screws, and remove the Spindle Motor Assy.

